

# LA-08 BIO-ENGINEERED OYSTER REEF DEMONSTRATION PROJECT



# PROJECT COMPLETION REPORT

April 2, 2012



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#### **Project Completion Report**

Bioengineered Oyster Reef Demonstration Project (LA-08)

#### 1 Project Contacts

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#### 2 LOCATION AND DESCRIPTION OF PROJECT AS APPROVED FOR CONSTRUCTION

The project involved constructing two breakwaters as a demonstration project with the objective of reducing erosion along the shoreline of the Rockefeller Wildlife Refuge, Louisiana. Each breakwater was 215 ft long, 42 ft wide, and constructed with precast OysterBreak Armor Units (armor units) and a marine mattress underlayer. One breakwater was constructed using armor units manufactured with normal weight concrete and the other breakwater was constructed using

OysterKrete, a proprietary concrete mix developed to attract oyster growth. Also included in the work was the installation of 4 navigation aids marking the extents of the breakwaters. Table 1 shows the items for work construction and monetary amounts. Only the Base Bid was awarded for construction.

Table 1: Items for work construction and monetary amounts.

	LA-08 Bioeng Estimate of Probable (			i Demonstra	ation Project -	- Constructio		AquaTerra	's Bid	
Item No.	Item Description	Quantity	Unit	Unit Price	Total Price	Bid Quantity	Unit	Bid Unit Price	Total Bid Price	% (+) Over/(-) Under
	Base Bid (215 ft structure)									
1	Mobilization	1	LS	\$200,000	\$200,000	1	LS	\$79,000	\$79,000	-61%
2	Construction Surveying	1	LS	\$47,582	\$47,582	1	LS	\$36,000	\$36,000	-24%
3	OysterBreak Armor Unit (OysterKrete) - Fabricate and Deliver	621	EA	\$367	\$227,907	621	EA	\$620	\$385,020	69%
4	OysterBreak Armor Unit (Normal Weight Concrete) - Fabricate and Deliver	621	EA	\$367	\$227,907	621	EA	\$610	\$378,810	66%
5	OysterBreak Armor Unit - Install	1,242	EA	\$115	\$142,830	1242	EA	\$90	\$111,780	-22%
6	Marine Mattress	18,060	SF	\$15	\$270,900	18060	SF	\$23.50	\$424,410	57%
7	Navigation Aids	4	EA	\$14,000	\$56,000	4	EA	\$10,400	\$41,600	-26%
	Base Price Sum				\$1,173,126					
	Contingency		10%		\$117,313					
	Base Price Total				\$1,290,439				\$1,456,620	13%
	Additive Bid 1 (Additional 30 ft of structu	ire)								
1	Construction Surveying	1	LS	\$6,639	\$6,639	1	LS	\$11,000	\$11,000	66%
2	OysterBreak Armor Unit (OysterKrete) - Fabricate and Deliver	90	EA	\$367	\$33,030	90	EA	\$638	\$57,420	74%
3	OysterBreak Armor Unit (Normal Weight Concrete) - Fabricate and Deliver	90	EA	\$367	\$33,030	90	EA	\$628	\$56,520	71%
4	OysterBreak Armor Unit - Install	180	EA	\$115	\$20,700	180	EA	\$90	\$16,200	-22%
5	Marine Mattress	2,520	SF	\$15	\$37,800	2,520	SF	\$23.50	\$59,220	57%
	Additive Bid 1 Sum				\$131,199					
	Contingency		10%		\$13,120					
	Additive Bid 1 Price Total				\$144,319				\$200,360	39%
	Base + Additive Bid 1 Price Total				\$1,434,758				\$1,656,980	15%
	Additive Bid 2 (Additional 30 ft of structu	ıre)								
1	Construction Surveying	1	LS	\$6,639	\$6,639	1	LS	\$11,000	\$11,000	66%
2	OysterBreak Armor Unit (OysterKrete) - Fabricate and Deliver	105	EA	\$367	\$38,535	90	EA	\$638	\$57,420	49%
3	OysterBreak Armor Unit (Normal Weight Concrete) - Fabricate and Deliver	105	EA	\$367	\$38,535	90	EA	\$628	\$56,520	47%
4	OysterBreak Armor Unit - Install	210	EA	\$115	\$24,150	180	EA	\$90	\$16,200	-33%
5	Marine Mattress	2,520	SF	\$15	\$37,800	2,520	SF	\$23.50	\$59,220	57%
	Additive Bid 2 Sum				\$145,659					
	Contingency		10%		\$14,566					
	Additive Bid 2 Price Total				\$160,225				\$200,360	28%
	Base + Additive Bid 1 + Additive Bid 2 Pr				\$1,594,982				\$1,857,340	16%
	Additive Bid 3 (Additional 30 ft of structu	,								
1	Construction Surveying	1	LS	\$6,639	\$6,639	1	LS	\$11,000	\$11,000	66%
2	OysterBreak Armor Unit (OysterKrete) - Fabricate and Deliver	90	EA	\$367	\$33,030	90	EA	\$638	\$57,420	74%
3	OysterBreak Armor Unit (Normal Weight Concrete) - Fabricate and Deliver	90	EA	\$367	\$33,030	90	EA	\$628	\$56,520	71%
4	OysterBreak Armor Unit - Install	180	EA	\$115	\$20,700	180	EA	\$90	\$16,200	-22%
5	Marine Mattress	2,520	SF	\$15	\$37,800	2,520	SF	\$23.50	\$59,220	57%
	Additive Bid 3 Sum				\$131,199					
	Contingency		10%		\$13,120					
	Additive Bid 3 Price Total				\$144,319				\$200,360	43%
	Base + Additive Bid 1 + Additive Bid 2 +	Additive Bio	l 3 Price	Total	\$1,739,301				\$2,057,700	18%

#### 3 FINAL AS-BUILT FEATURES AND BOUNDARIES

The contractor, AquaTerra Contracting LP (AquaTerra), constructed approximately 462 ft of breakwater including 18,480 square feet of marine mattress and 1,242 armor units. Additionally, 10 OysterKrete and 8 Normal Weight Concrete armor units were installed at the southern extent of the landing strip at Joseph's Harbor Bayou. Construction began on the Normal Weight Concrete Breakwater B first. Marine mattresses were placed prior to armor unit installation. Construction of the OysterKrete Breakwater A followed in a similar fashion. AquaTerra manufactured an additional 4 marine mattresses and installed them between Breakwaters A and B from approximately Sta 2+15 to 2+20 and Sta 3+45 to 3+50 per direction from CPRA. AquaTerra also installed 4 navigation aids which consisted of a 56 ft long x 16" diameter steel pile, a 3 ft square dayboard, and a marine lantern. Original and as-built quantities are shown in Table 2.

Table 2: Original and as-built quantities.

Item No.	Item Description	Original Quantity	As-built Quantity	Unit	Unit Cost	Original Cost	As-built Cost
1	Mobilization	1	1	LS	\$79,000.00	\$ 79,000.00	\$ 79,000.00
2	Construction Surveying	1	1	LS	\$36,000.00	\$ 36,000.00	\$ 36,000.00
3	Oysterbreak Armor Unit (Oysterkrete) - Fabricate and Deliver	621	631	EA	\$ 620.00	\$ 385,020.00	\$ 391,220.00
4	Oysterbreak Armor Unit (Normal Weight Concrete) - Fabricate and Deliver	621	629	EA	\$ 610.00	\$ 378,810.00	\$ 383,690.00
5	Oysterbreak Armor Unit - Install	1,242	1,260	EA	\$ 90.00	\$ 111,780.00	\$ 113,400.00
6	Marine Mattress	18,060	18,480	SF	\$ 23.50	\$ 424,410.00	\$ 434,280.00
7	Navigation Aids	4	4	EA	\$10,400.00	\$ 41,600.00	\$ 41,600.00
8	Credit for Marine Mattress Geotextile Material	0	1	LS	\$ (619.18)	N/A	\$ (619.18)
	Total					\$1,456,620.00	\$1,478,570.82

#### 4 Construction and Construction Oversight

Prime Construction Contractor: AquaTerra Contracting LP

POC: Blake Dwoskin (281) 330-8114

11498 Luna Road, Suite 106

Dallas, TX 75234

Subcontractors: Wayfarer Environmental Technologies, LLC

POC: Mike Turley (410) 917-7098

13021 Beaver Dam Road Hunt Valley, MD 21031

Oldcastle Precast, Inc. 13600 South Wayside Houston, TX 77048

C.H. Fenstermaker & Associates, Inc.

135 Regency Square

Lafayette, LA 70508

Tensar International Corporation 2500 Northwinds Parkway, Suite 500

Alpharetta, GA 30009

Original Construction Contract: \$1,456,620.00
Change Orders: \$21,950.82
Over/Under Runs: \$0
Final Construction Contract: \$1,478,570.82

#### 5 Oversight and Administration for Construction Engineering Services

Construction Oversight Contractor: Coast & Harbor Engineering, Inc.

POC: Josh Carter, PE (512) 342-9707 3410 Far West Boulevard, Suite 210

Austin, TX 78731

Subcontractor: Hunt, Guillot and Associates, LLC

POC: Bill Blankenship (225) 927-6825

603 Reynolds Drive Ruston, LA 71270

Original Oversight Contract: \$112,829.00

Change Orders: \$0

Final Oversight Contract: \$112,829.00

#### 6 Key Project Cost Elements

	Project Cost Estimate	Cost Incurred as of Construction Completion
Construction	\$1,290,439.00	\$1,478,570.82
Engineering & Design	\$163,100.00	\$163,100.00
Construction Phase Engineering Services	\$112,829.00	\$112,829.00
Total	\$1,566,368.00	\$1,754,499.82

#### 7 MAJOR EQUIPMENT USED

- (1) American 9310 Crane
- (1) Komatsu PC 400 LC Excavator
- (1) JLG G10-55A Forklift
- (1) Tugboat
- (3) Barges

#### 8 Construction Sequences and Activities

Construction began by manufacturing the armor units at the Oldcastle Precast site in Houston, TX. After inspection and review of material testing data, the armor units were authorized to be shipped to the stockpile site at Joseph's Harbor Bayou. AquaTerra was not authorized to mobilize to the project site until they received a "Notice to Mobilize" which was furnished once 600 armor units were inspected and accepted.

Armor units were inspected at the Oldcastle Precast site four times. The original contract stated that only three inspections were included and any additional inspections would be paid for by AquaTerra. The fourth inspection was necessary because several material testing results for the OysterKrete armor units showed insufficient compressive strengths. Oldcastle attempted to core the subject armor units, but satisfactory test results were not obtained. A total of 225 OysterKrete armor units were rejected by Wayfarer and were remanufactured. Oldcastle Precast accepted full responsibility for the rejected units and revised their manufacturing procedure, QA/QC program, and testing methodology. It was thought that the poor strength test results were primarily a result of the test cylinder casting methodology, which differed from the actual unit casting methodology. The testing methodology was changed to better reflect the final product. Prior to the change, the OysterKrete armor unit's test results showed compressive strengths varying from approximately 1,700 to 6,400 psi (the minimum acceptable compressive strength was 3,000 psi). After the change, compressive strengths varied from approximately 3,200 to 8,400 psi (only one test was below 4,400 psi).

Construction activities began on Breakwater B using Normal Weight Concrete Armor Units on 12/8/2011 at Sta 3+50 and finished on 1/14/2012 at Sta 5+65 (38 calendar days). Breakwater B was constructed in 8 work days. The remaining 30 days were weather days or where AquaTerra took a break during the Christmas and New Year's holidays.

Construction activities began for Breakwater A using Oysterkrete Armor Units on 1/27/2012 at Sta 0+00 and finished on 2/7/2012 at Sta 2+15 (13 calendar days). Breakwater A was constructed in 6 work days with the remaining 7 days being weather days.

AquaTerra had the following difficulties constructing the project:

- 1. Placing the marine mattresses underwater so adjacent sides were touching. The difficulty was due to the lack of water clarity and the soft, draped nature of the installation. Marine mattresses were authorized to be placed with a gap between adjacent mattresses (in the cross-shore direction) no greater than 3-4 inches, and with no gap in the along-shore direction.
- 2. Placing the armor units in a straight alignment. Construction Survey 1 showed an area of placed armor units was as little as approximately 4 ft from the edge of the marine mattress on the seaward extents (the construction drawings showed this value as 6 ft). Since this issue was localized to a small area, the subject armor units were not required to be repositioned. Corrective measures included the installation of the construction baseline to measure the correct offsets to supplement staking. After implementation of the corrective measures, the units were placed in the correct alignment.
- 3. Placing the armor units such that each unit touched the adjacent units. The soft soils settled under the weight of the marine mattress and armor units fairly quickly, however, the settlement was not homogenous. This inhomogeneous settlement caused the top row of

armor units to appear as if they could be placed closer together despite the bottom row of armor units touching adjacent armor units. Many top armor units were touching, but several would be as much as 3 inches apart. This was determined to be acceptable.

AquaTerra fabricated an additional 4 marine mattresses for the project in case any mattresses were damaged during installation. No additional mattresses were required during installation. Therefore, CPRA, NOAA, and CHE determined that the extra marine mattresses would be placed in the gap between Breakwaters A and B adjacent to the previously placed marine mattresses, as this location was thought to be at highest risk to scour.

Navigation aids were installed on 2/8/2012 and 2/9/2012. Navigation aid piles were designed to have the top 1 ft cut off after installation in the event that the tip was damaged during the installation process. AquaTerra installed the piles with a vibratory hammer rather than an impact hammer, and any damage as a result of installation was cosmetic. The pile tip was authorized to remain intact. The piles were driven to the elevation specified in the plans.

#### 9 Construction Dates

Construction Item	Date
Bid Opening	June 15, 2011
Construction Contract Awarded	July 19, 2011
Pre-Construction Conference	July 28, 2011
Notice to Proceed	August 2, 2011
Notice to Mobilize	October 25, 2011
Start of Breakwater Construction	December 8, 2011
Substantial Completion	February 7, 2012
Contractor's Notice of Final Completion	February 17, 2012
Final Acceptance	March 8, 2012
Demobilization	March 8, 2012

#### 10 CONSTRUCTION CHANGE ORDERS AND FIELD CHANGES

Change Order 1 was executed to increase the contract quantities for as-built features which included OysterKrete and Normal Weight Concrete armor unit fabrication, delivery, and installation, as well as marine mattress fabrication and installation. Additionally, Change Order 1 included a credit after Tensar, the marine mattress manufacturer, had installed the wrong geotextile fabric on the underside of the marine mattress. This discovery was made on 10/19/2011, after 54 of the 172 required marine mattresses had been fabricated. The geotextile provided weighed 12 oz/square yard while the contract required 16 oz/square yard. The 12 oz/square yard geotextile was determined to provide adequate performance for 54 marine mattresses and would not require a change in the geotextile material. The time required to re-fabricate and re-ship the 54 marine mattresses with the required 16 oz/square yard geotextile would be significant with a negligible increase in performance. Field changes to the marine mattress posed a potential for strength reduction due to overworking the marine mattress which could present a safety issue during lifting operations. The change order issued a credit for the price difference between the 12 oz/square yard and 16 oz/square yard geotextile on 54 marine mattresses. The total change order was \$21,950.82.

#### 11 SAFETY AND ACCIDENTS

No accidents were observed or reported.

#### 12 PIPELINE AND UTILITY CROSSING OWNER INFORMATION

No pipelines or utilities were crossed or affected during construction.

#### 13 Additional Comments Pertaining to Construction

AquaTerra's construction was slowed significantly due to weather and only worked when the wind was out of the North. Due to the nature of the project, AquaTerra elected to not work when waves exceeded approximately 2 ft in order to prevent injury and to ensure accurate placement of units.

Production rates during construction were as follows:

- Marine mattresses approximately 10 minutes per mattress (6 mattresses per hour or 630 square feet per hour).
- Armor units approximately 20 minutes per 15 armor units (45 armor units per hour). AquaTerra's best day of production was 210 armor units in 4.5 hours.
- Navigation aids approximately 1 hour including repositioning for each pile. Welding, touch up painting, dayboard installation, and marine light installation were approximately 3 hours per pile.

The daily production rates were limited to the amount of material they could barge in at a time as the barges had to be light-loaded due to the nearshore bathymetry. AquaTerra's barges could carry 210 armor units at a time when light-loaded. Removing the unit delivery limitation and assuming good weather, AquaTerra could have constructed each breakwater in approximately 4 days.

AquaTerra was required to repair the landing strip/access road at the Rockefeller Wildlife Refuge at the Joseph's Harbor Bayou stockpile site at the direction of the CPRA. AquaTerra repaired the entire access road including site work grading, placement of 590 tons of limestone gravel and pothole repair.

## **APPENDIX A**

**Project Permits** 



#### DEPARTMENT OF THE ARMY

NEW ORLEANS DISTRICT, CORPS OF ENGINEERS PO. BOX 60267

NEV ORLEANS, LOUISIANA 70160-0267

ILIN 0 7 2010

Operations Division Western Evaluation Section

SUBJECT: MVN-2010-0973-WLL

Office of Coastal Protection and Restoration ATTN: Kristi Cantu P.O. Box 44027 Baton Rouge, LA 70804

Gentlemen,

The proposed work, to excavate 4030 cubic yards of waterbottom sediment and place onsite, 950 cubic yards of aggregate material and 2520 cubic yards of cement oysterbreak armor units along the shoreline of the Gulf of Mexico west of Joseph's Harbor Canal in Cameron Parish, Louisiana for the purpose of implementing an oyster reef demonstration project is authorized under a Category II Programmatic General Permit provided that all conditions of the permit are met.

Prior to commencing work on your project, you must obtain approvals from state and local agencies as required by law and by the terms of this permit. These approvals include, but are not limited to, a permit or waiver from the Coastal Management Division of the Louisiana Department of Natural Resources and a water quality certification from the Louisiana Department of Environmental Quality, Office of Water Resources.

Prior to any work on the refuge, the permittee shall coordinate all activities with the Rockefeller Refuge Manager.

If the work is initiated within two (2) years of the date of this letter, the authorization remains valid for a total of five (5) years from the date of this letter. If the work is not initiated within two (2) years, this authorization becomes null and void.

The New Orleans District Regulatory Branch is committed to providing quality and timely service to our customers. In an effort to improve customer service, please take a moment to complete the attached Customer Service Survey and return it in the envelope provided or go to the survey found on our web site at <a href="http://per2.nwp.usace.army.mil/survey.html">http://per2.nwp.usace.army.mil/survey.html</a>.

Should you have any further questions concerning this matter, please contact Mike Herrmann of this office at (504) 862-1954.

Fete J. Serio
Chief, Regulatory Branch

Enclosures

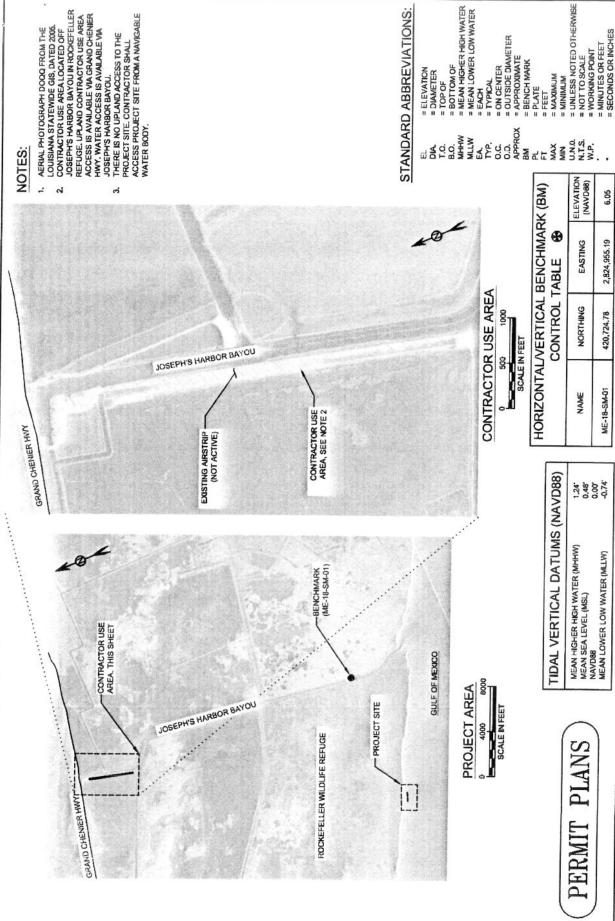
- 1. Activities authorized under this general permit shall not be used for piecemeal work and shall be applied to single and complete projects. All components of a single and complete project shall be treated together as constituting one single and complete project. All planned phases of multi-phased projects shall be treated together as constituting one single and complete project. This general permit shall not be used for any activity that is part of an overall project for which an individual permit is required.
- 2. No activity is authorized under this general permit which may adversely affect significant cultural resources listed or eligible for listing in the National Register of Historic Places until the requirements for Section 106 of the National Historic Preservation Act are met. Upon discovery of the presence of previously unknown historic and/or prehistoric cultural resources, all work must cease and the permittee must notify the State Historic Preservation Office and the Corps of Engineers. The authorization is suspended until it is determined whether or not the activity will have an adverse effect on cultural resources. The authorization may be reactivated or modified through specific conditions if necessary, if it is determined that the activity will have no adverse effect on cultural resources. The NOD-PGP authorization will be revoked if it is determined that cultural resources would be adversely affected, and an individual permit may be necessary.
- 3. The Chitimacha Tribe of Louisiana has stated that the project area is part of the aboriginal Chitimacha homelands. If during the course of work at the site, prehistoric and/or historic aboriginal cultural materials are discovered, the applicant will contact the Chitimacha Tribe of Louisiana at P.O. Box 661, Charenton, LA 70523, and the Army Corps of Engineers, New Orleans District (NOD) Regulatory Branch. NOD will initiate the required Federal, State, and Tribal coordination to determine the significance of the cultural materials and the need, if applicable, for additional cultural resource investigations.
- 4. There shall be no unreasonable interference with navigation by the existence or use of the activity authorized herein. The permittee will, at his or her expense, install and maintain any safety lights, signals, and signs prescribed by the United States Coast Guard, through regulations or otherwise, on authorized facilities or on equipment used in performing work under the authorization.
- 5. No activity may substantially disrupt the movement of those species of aquatic life indigenous to the waterbody, including those species which normally migrate through the area, unless the activity's primary purpose is to block or impound water.
- 6. If the proposed activity involves the installation of aerial transmission lines, submerged cable, or submerged pipelines across navigable waters of the United States the following is applicable:

The National Ocean Service (NOS) has been notified of this authorization. You must notify NOS and this office in writing, at least two weeks before you begin work and upon completion of the activity authorized by this permit. Your notification of completion must include a drawing which certifies the location and configuration of the completed activity (a certified permit drawing may be used). Notification to NOS will be sent to the following address: National Ocean Service, Office of Coast Survey, N/CS261, 1315 East West Highway, Silver Springs, Maryland 20910-3282.

7. For pipelines under an anchorage or a designated fairway in the Gulf of Mexico the following is applicable: The National Ocean Service has been notified of this authorization. You must notify NOS and this office in writing, at least two weeks before you begin work and upon completion of the activity authorized by this permit. Within 30 days of completion of the pipeline, 'as built' drawings certified by a professional engineer registered in Louisiana or by a registered surveyor shall be furnished to this office, the U.S. Coast Guard, Sector New Orleans Command Center, 201 Hammond Highway, Metairie, Louisiana 70005, and to the Director, National Ocean Service, Office of Coast Survey, N/CS261, 1315 East West Highway, Silver Springs, Maryland 20910-3282. The plans must include the location, configuration and actual burial depth of the completed pipeline project.

- 8. If the proposed project, or future maintenance work, involves the use of floating construction equipment (barge mounted cranes, barge mounted pile driving equipment, floating dredge equipment, dredge discharge pipelines, etc.,) in a federally maintained waterway, you are advised to notify the Eighth Coast Guard District so that a Notice to Mariners, if required, may be prepared. Notification with a copy of your permit approval and drawings should be mailed to the US Coast Guard, Sector New Orleans Command Center, 201 Hammond Highway, Metairie, Louisiana 70005, about 1 month before you plan to start work. Telephone inquiries can be directed to (504) 846-5923.
- 9. All activities authorized herein shall, if they involve, during their construction or operation, any discharge of pollutants into waters if the United States, be at all times consistent with applicable water quality standards, effluent limitations and standards of performance, prohibitions, pretreatment standards and management practices established pursuant to the Clean Water Act (PL 92-500: 86 Stat 816), or pursuant to applicable state and local laws.
- 10. Substantive changes to the Louisiana Coastal Resources Program may require immediate suspension and revocation of this permit in accordance with 33 CFR 325.7.
- 11. Irrespective of whether a project meets the other conditions of this permit, the Corps of Engineers retains discretionary authority to require an individual Department of the Army permit when circumstances of the proposal warrant this requirement.
- 12. Any individual authorization granted under this permit may be either modified, suspended, or revoked in whole or in part if the Secretary of the Army or his authorized representative determines that there has been a violation of any of the terms or conditions of this permit or that such action would otherwise be in the public interest.
- 13. The Corps of Engineers may suspend, modify, or revoke this general permit if it is found in the public interest to do so.
- 14. Activities proposed for authorization under the PGP must comply with all other necessary federal, state, and/or local permits, licenses, or approvals. Failure to do so would result in a violation of the terms and conditions of NOD-PGP.
- 15. The permittee shall permit the District Engineers or his authorized representative(s) or designee(s) to make periodic inspections of the project site(s) and disposal site(s) if different from the project site(s) at any time deemed necessary in order to assure that the activity being performed under authority of this permit is in accordance with the terms and conditions prescribed herein.
- 16. This general permit does not convey any property rights, either in real estate or material, or any exclusive privileges; and it does not authorize any injury to property or invasion of rights or any infringement of federal, state, or local laws or regulations nor does it obviate the requirements to obtain state or local assent required by law for the activity authorized herein.
- 17. In issuing authorizations under this permit, the federal government will rely upon information and data supplied by the applicant. If, subsequent to the issuance of an authorization, such information and data prove to be false, incomplete, or inaccurate, the authorization may be modified, suspended, or revoked, in whole or in part.
- 18. For activities resulting in sewage generation at the project site, such sewage shall be processed through a municipal sewage treatment system or, in areas where tie-in to a municipal system is not practical, the on-site sewerage system must be approved by the local parish sanitarian before construction.
- 19. Any modification, suspension, or revocation of this permit or any individual authorization granted under this permit will not be the basis for any claim for damages against the United States.
- 20. Additional conditions deemed necessary to protect the public interest may be added to the general permit by the District Engineer at any time. If additional conditions are added, the public will be advised by public notice. Individual authorizations under this PGP may include special conditions deemed necessary to ensure minimal impact and compliance with this PGP.

- 21. A review of cumulative losses under the general permit will be accomplished yearly in or around the month of October. A report of losses will be furnished to the Environmental Protection Agency, the US Fish and Wildlife Service, the National Marine Fisheries Service, and the Louisiana Department of Wildlife and Fisheries. Comments from reviewing agencies will be considered in determination as to whether modifications to the general permit are needed. Should the District Engineer make a determination not to incorporate a change proposed by a reviewing agency, after normal negotiations between the respective agencies, the District Engineer will explain in writing to the reviewing agency the basis and rationale for his decision.
- 22. The New Orleans District will periodically review NOD-PGP and its terms, conditions, and processing procedures and will decide to either modify, reissue, or revoke the permit. If the PGP is not modified or reissued within 5 years of its effective date, it automatically expires and becomes null and void. Activities which have commenced or are under contract to commence in reliance upon prior authorization of NOD-PGP will remain authorized provided the activity is completed within 12 months of the date of NOD-PGP expiration, modification, or revocation, unless the Corps of Engineers has determined that the specific activity does not qualify for authorization under NOD-PGP and exercises Corps authority to modify, suspend, or revoke the authorization in accordance with DOA regulations at 33 CFR 325.7.
- 23. Activities which qualify as non reporting nationwide permits and which commenced or were under contract to commence prior to June 1, 1998, are valid for a period of two years from the commencement/contract date. Those activities which have received authorization under the nationwide and regional general permit programs expire as indicated on the permit authorization. Requests received on or after June 1, 1998, will be evaluated for compliance under NOD-PGP.
- 24. The permittee understands and agrees that, if future operations by the United States require the removal, relocation, or other alteration, of the structure or work herein authorized, or if, in the opinion of the Secretary of the Army or his authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, the permittee will be required, upon due notice from the Corps of Engineers, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United States. No claim shall be made against the United States on account of any such removal or alteration.
- 25. You must maintain the activity authorized by this permit in good condition and in conformance with the terms and conditions of this permit. You are not relieved of this requirement if you abandon the permitted activity, although you may make a good faith transfer to a third party in compliance with General Condition 4 below. Should you wish to cease to maintain the authorized activity or should you desire to abandon it without a good faith transfer, you must obtain a modification of this permit from this office, which may require restoration of the area.
- 26. If you discover any previously unknown historic or archeological remains while accomplishing the activity authorized by this permit, you must immediately notify this office of what you have found. We will initiate the Federal and State coordination required to determine if the remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.
- 27. If you sell the property associated with this permit, you must provide this office with a copy of the permit and a letter noting your agreement to transfer the permit to the new owner and the new owners agreement to accept the permit and abide by all conditions of the permit. This letter must be signed by both parties.
- 28. If a conditioned water quality certification has been issued for your project, you must comply with the conditions specified in the certification as special conditions to this permit.
- 29. Many local governing bodies have instituted laws and/or ordinances in order to regulate dredge and/or fill activities in floodplains to assure maintenance of floodwater storage capacity and avoid disruption of drainage patterns that may affect surrounding properties. Your project involves dredging and/or placement of fill, therefore, you must contact the local municipal and/or parish governing body regarding potential impacts to floodplains and compliance of your proposed activities with local floodplain ordinances, regulations or permits.



# STANDARD ABBREVIATIONS:

= MEAN HIGHER HIGH WATER = MEAN LOWER LOW WATER = BOTTOM OF = DIAMETER = TOP OF = ELEVATION

= EACH

= TYPKAL = ON CENTER = OUTSIDE DIAMETER = APPROXIMATE

= BENCH MARK = PLATE

= MAXIMUM = MINIMUM

= UNLESS NOTED OTHERWISE = NOT TO SCALE = WORKING POINT = MINUTES OR FEET = SECONDS OR INCHES

PROJECT AREA AND CONTRACTOR USE AREA

BIO-ENGINEERED OYSTER REEF DEMONSTRATION PROJECT

STATE PROJECT NUMBER: LA-08

FEDERAL PROJECT NUMBER: LA-08

APPROVED BY: WHITNEY THOMPSON

DESIGNED BY: S. HICKS

DRAWN BY: I. MORRISON

COAST & HARBOR ENGINEERING 343 340 STREET, SUITE 306 BATON ROUGE, LA 70801 PH 512-342-9706 FAX 512-342-9706

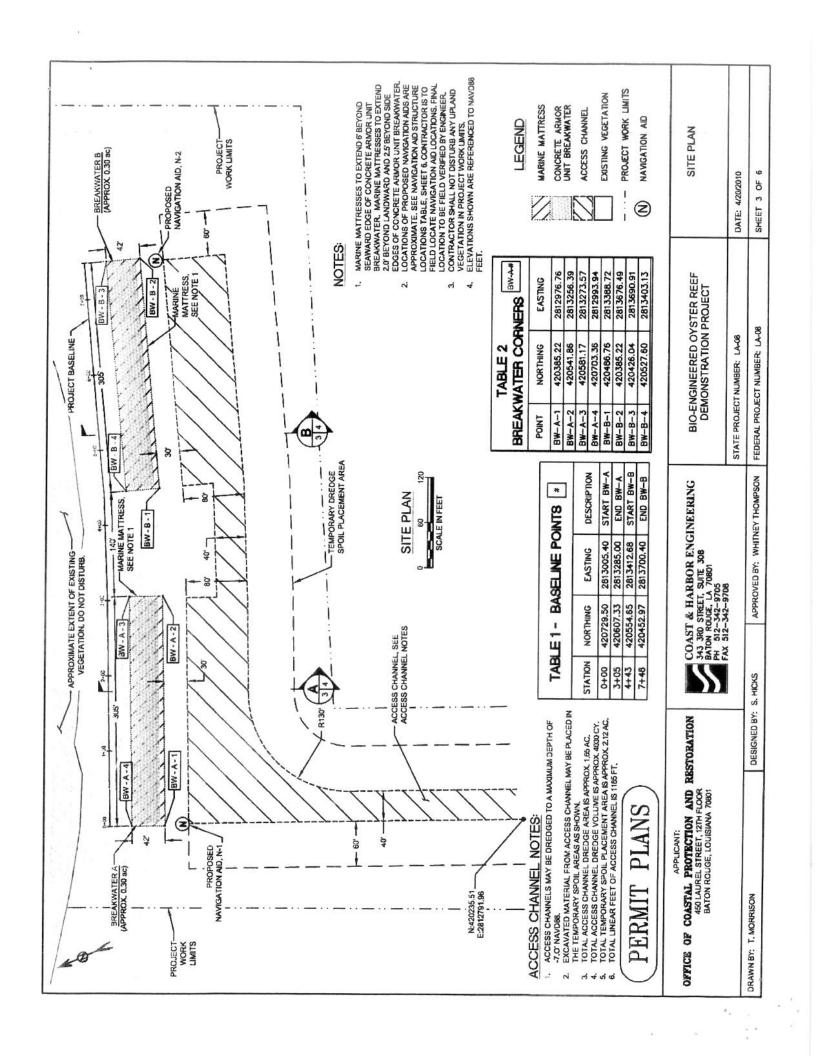
COASTAL PROTECTION AND RESTORATION 450 LAUREL STREET, 12TH FLOOR BATON ROUGE, LOUISIANA 70801

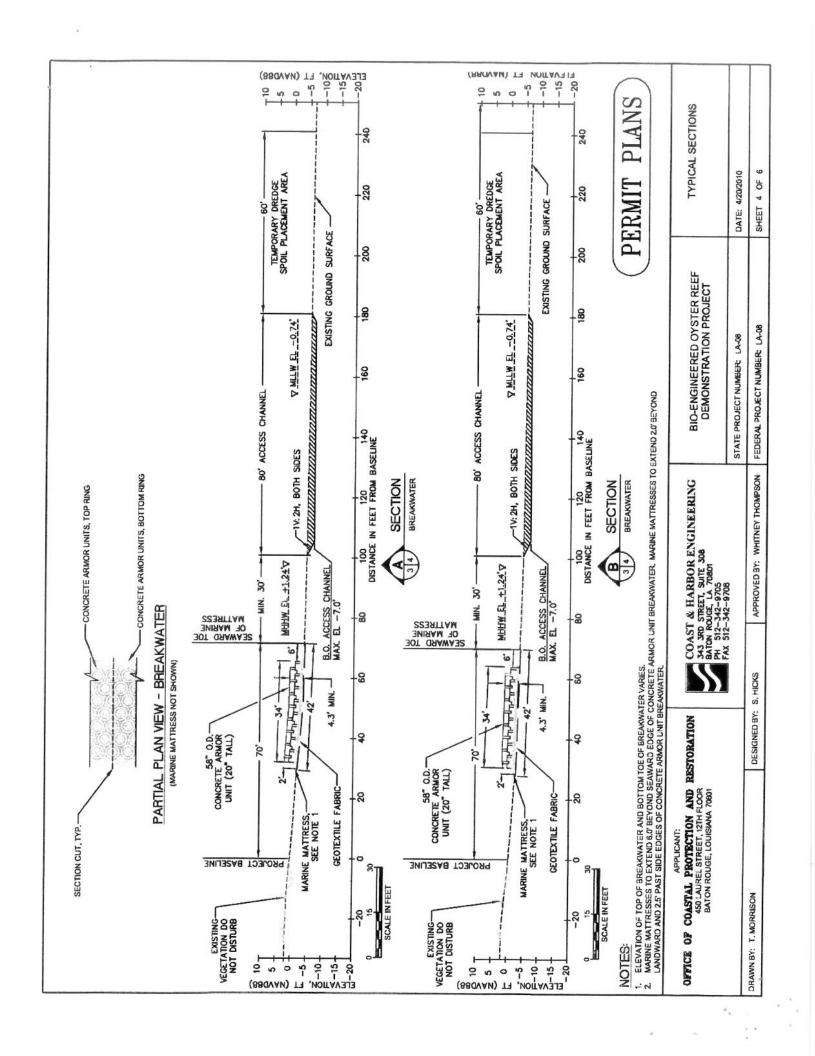
APPLICANT:

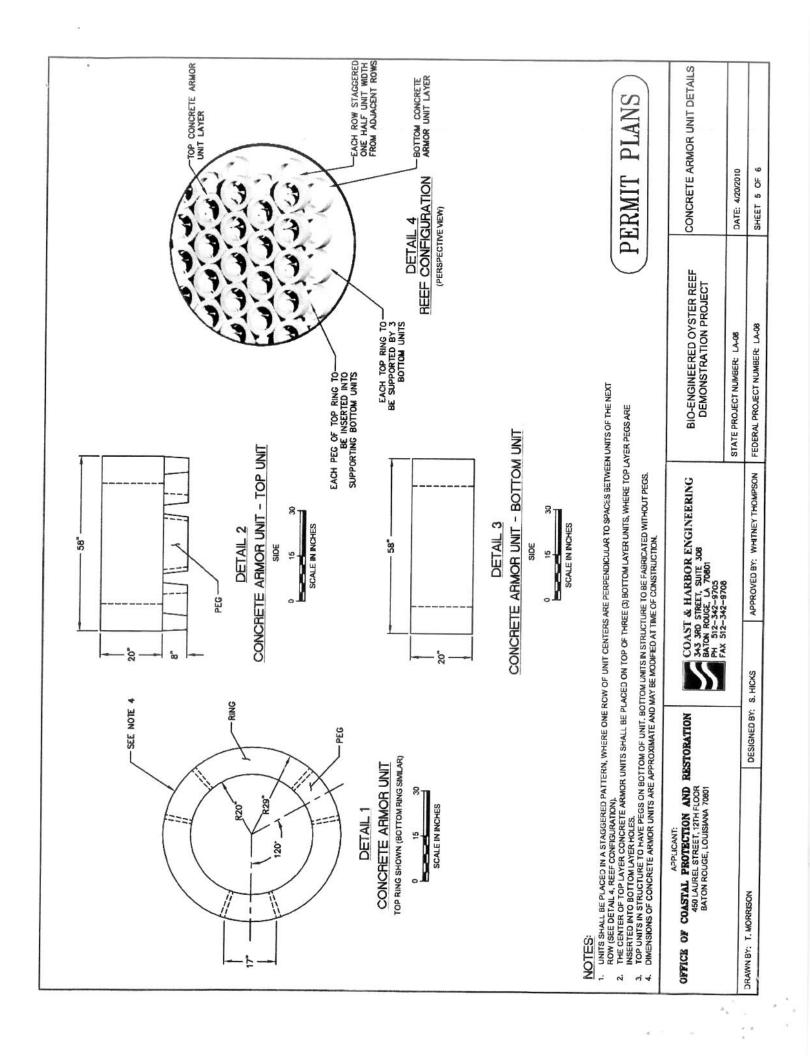
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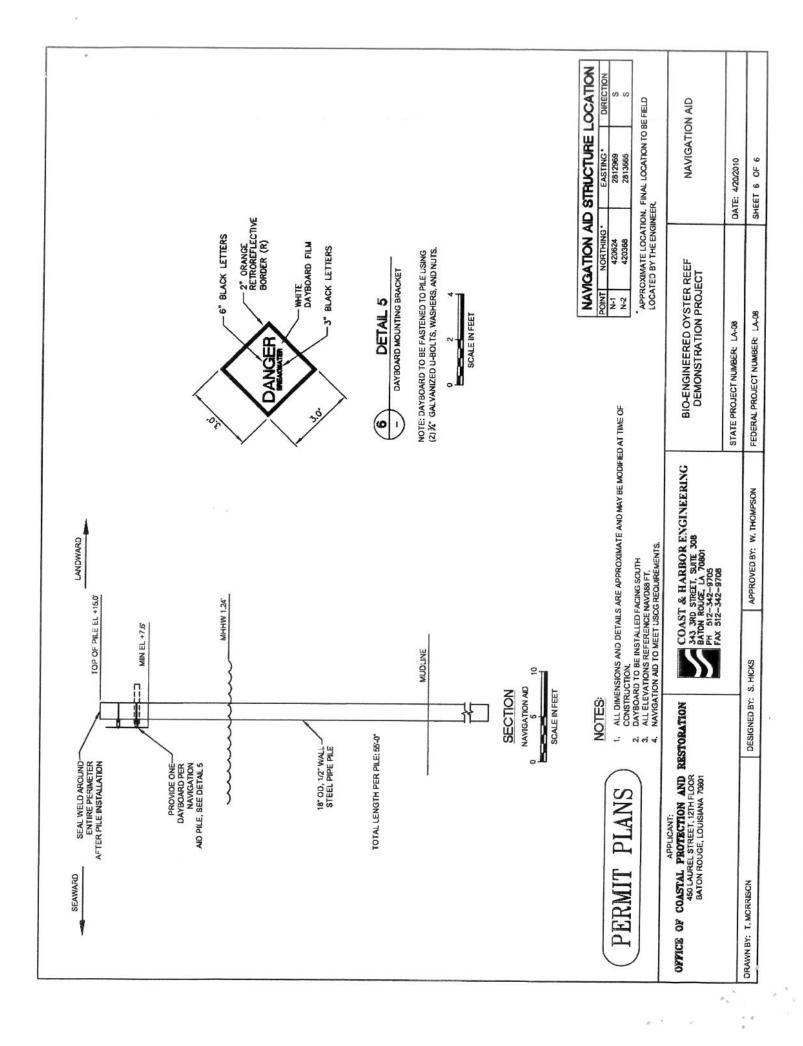
DATE: 4/20/2010

SHEET 2 OF











# DEPARTMENT OF NATURAL RESOURCES OFFICE OF COASTAL MANAGEMENT

P.O. BOX 44487 BATON ROUGE, LOUISIANA 70804-4487 (225)342-7591 1-800-267-4019

#### COASTAL USE PERMIT/CONSISTENCY DETERMINATION

C.U.P. No.: P20100399

C.O.E. No.: MVN- 2010- 0973- WLL

NAME: OFFICE OF COASTAL PROTECTION AND RESTORATION

P.O. BOX 44027

BATON ROUGE, LA 70804

Attn: Kristi Cantu

LOCATION: Cameron Parish, LA

Lat 29° 38' 50"N / Long 92° 48' 09"W; Section 17 T16S R4W; Gulf of Mexico, Grand Chenier, La.

**DESCRIPTION:** Proposed installation of two 42' x 305' breakwaters for the Bio-Engineered Oyster Reef Demonstration

Project (LA-08). Access excavations of an approximately 40' x 350' area and 80' x 750' area are required. Approximately 4,030 cubic yards of native material will be excavated and backfilled, 950 cubic yards of crushed stone or gravel will be used as fill and 2,520 cubic yards of Oysterbreak armor units will be used as

fill. No other dredge or fill required.

In accordance with the rules and regulations of the Louisiana Coastal Resources Program and Louisiana R.S. 49, Sections 214.21 to 214.41, the State and Local Coastal Resources Management Act of 1978, as amended, the permittee agrees to:

- 1. Carry out, perform, and/or operate the use in accordance with the permit conditions, plans and specifications approved by the Department of Natural Resources.
- 2. Comply with any permit conditions imposed by the Department of Natural Resources.
- 3. Adjust, alter or remove any structure or other physical evidence of the permitted use if, in the opinion of the Department of Natural Resources, it proves to be beyond the scope of the use as approved or is abandoned.
- 4. Provide, if required by the Department of Natural Resources, an acceptable surety bond in an appropriate amount to ensure adjustment, alteration, or removal should the Department of Natural Resources determine it necessary.
- 5. Hold and save the State of Louisiana, the local government, the department, and their officers and employees harmless from any damage to persons or property which might result from the use, including the work, activity, or structure permitted.
- 6. Certify that the use has been completed in an acceptable and satisfactory manner and in accordance with the plans and specifications approved by the Department of Natural Resources. The Department of Natural Resources may, when appropriate, require such certification to be given by a registered professional engineer.
- 7. All terms of the permit shall be subject to all applicable federal and state laws and regulations.
- 8. This permit, or a copy thereof, shall be available for inspection at the site of work at all times during operations.
- 9. The applicant will notify the Office of Coastal Management of the date on which initiation of the permitted activity described under the "Coastal Use Description" began. The applicant shall notify the Office of Coastal Management by mailing the enclosed green initiation card on the date of initiation of the coastal use.
- 10. Unless specified elsewhere in this permit, this permit authorizes the initiation of the coastal use described under "Coastal Use Description" for two years from the date of the signature of the Secretary or his designee. If the coastal use is not initiated within this two year period, then this permit will expire and the applicant will be required to submit a new application. Initiation of the coastal use, for the purposes of this permit, means the actual physical beginning of the use of activity for which the permit is required. Initiation does not include preparatory activities, such as movement of equipment onto the coastal use site, expenditure of funds, contracting out of work, or performing activities which by themselves do not require a permit. In addition, the permittee must, in good faith, and with due diligence, reasonably progress toward completion of the project once the coastal use has been initiated.
- 11. The following special conditions must also be met in order for the use to meet the guidelines of the Coastal Resources Program:
  - a. All logs, stumps and other debris unearthed during dredging shall be removed to an approved disposal site on land.
  - b. That permittee shall insure that all sanitary sewage and/or related domestic wastes generated during the subject project activity and at the site, thereafter, as may become necessary shall receive the equivalent of secondary treatment (30 mg/l BOD5) with disinfection prior to discharge into any of the streams or adjacent waters of the area or, in the case of total containment, shall be disposed of in approved sewerage and sewage treatment facilities, as is required by the State Sanitary Code. Such opinion as may be served by those comments offered herein shall not be construed to suffice as any more formal approval(s) which may be required of possible sanitary details (i.e. provisions)

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C.U.P. No.: P20100399

C.O.E. No.: MVN- 2010- 0973- WLL



scheduled to be associated with the subject activity. Such shall generally require that appropriate plans and specifications be submitted to the Department of Health and Hospitals for purpose of review and approval prior to any utilization of such provisions.

- c. As-built drawings shall be submitted within 30 days of completion of this project to the Louisiana Department of Natural Resources, Office of Coastal Management, PO Box 44487, Baton Rouge, LA 70804-4487.
- d. Structures must be marked/lighted in accordance with U. S. Coast Guard regulations.
- e. That should changes in the location or the section of the existing waterways, or in the generally prevailing conditions in the vicinity be required in the future, in the public interest, Permittee shall make such changes in the project concerned or in the arrangement thereof as may be necessary to satisfactorily meet the situation and shall bear the cost thereof. This condition does not preclude the necessity for revising the current permit or obtaining a separate Coastal Use Permit, should one be required, for project modifications.
- f. All structures built under the authorization and conditions of this permit shall be removed from the site within 120 days of abandonment of the facilities for the herein permitted use, are displaced, or when these structures fall into a state of disrepair such that they can no longer function as intended. This condition does not preclude the necessity for revising the current permit or obtaining a separate Coastal Use Permit, should one be required, for such removal activities.
- g. Prior to any activities on the Rockefeller Refuge (Refuge), the Office of Coastal Protection and Restoration (OCPR) shall notify Vaughan McDonald, in writing their intent to begin the project and give a brief outline of the project schedule. Upon receipt fo this notification, the Louisiana Department of Wildlife and Fisheries (LDWF) may request a pre-project meeting with the applicant to coordinate project details.
  - Prior to any activities on the Refuge, OCPR and their assigns shall coordinate all activities with Mr. Guthrie Perry, Refuge Manager or his assigns. Mr. Perry may require a pre-project meeting if deemed necessary. Mr. Perry can be reached at 337-538-2276.
- h. If this authorization must be revised, amended, or extended, the permittee shall submit a valid Letter of Clearance from LDWF, if the proposed activity will occur on the Refuge.
- This project has been reviewed for potential impacts to resources of concern to the Louisiana Natural Heritage
  Program. One species (Charadrius melodus Piping Plover) of concern has been identified as potentially being within
  the area surrounding this project.

The Piping Plover ((Charadrius melodus) may occur within the project area. This species is federally listed as threatened with its critical habitat designated along the Louisiana coast. Piping Plovers winter in Louisiana feeding at intertidal beaches, mudflats, and sand flats with sparse emergent vegetation. Primary threats to this species are destruction and degradation of winter habitat, habitat alteration through shoreline erosion, woody species encroachment of lake shorelines and riverbanks, and human disturbance of foraging birds. For more information on Piping Plover critical habitat, visit the U.S. Fish and Wildlife website: http://endangered.fws.gov.

The Louisiana Natural Heritage Program (LNHP) has compiled data on rare, endangered, or otherwise significant plant and animal species, plant communities, and other natural features throughout the State of Louisiana. LNHP reports summarize the existing information known at the time of the request regarding the location in question. LNHP reports should not be considered final statements on the biological elements or areas being considered, nor should they be substituted for on-site surveys required for environmental assessments. If at any time LNHP tracked species are encountered within the project area, please contact the Louisiana Department of Wildlife and Fisheries biologist at 225-765-2643.

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- Spoil shall be marked in accordance with USGC regulations for marking temporary spoil mounds.
- k. This permit does not convey any property rights, mineral rights, or exclusive privileges; nor does it authorize injury to property.
- I. All fill material shall be clean and free of contaminants and shall not contain hazardous materials such as asbestos or asbestos residue, shingles, tires, oil/grease residue, exposed rebar, protruding objects, etc.)
- m. Permittee is subject to all applicable state laws related to damages which are demonstrated to have been caused by this action.
- n. Permittee shall allow representatives of the Office of Coastal Management or authorized agents to make periodic, unannounced inspections to assure the activity being performed is in accordance with the conditions of this permit.
- o. Permittee shall comply with all applicable state laws regarding the need to contact the Louisiana One Call (LOC) system (1-800-272-3020) to locate any buried cables and pipelines.
- p. This permit authorizes the initiation of the Coastal Use described under "Coastal Use Description" for two (2) years from the date of the signature of the Secretary or his designee. Initiation of the Coastal Use, for purposes of this permit, means the actual physical beginning of the use or activity for which the permit is required. Initiation does not include preparatory activities, such as movement of equipment onto the Coastal Use site, expenditure of funds, contracting out of work, or performing activities which by themselves do not require a permit. In addition, Permittee must, in good faith and with due diligence, reasonably progress toward completion of the project once the Coastal Use has been initiated. If the Coastal Use is not initiated within this two (2) year period, an extension may be granted pursuant to the requirements contained in the Rules and Procedures for Coastal Use Permits (Title 43:1.723.D.). Please note that a request for permit extension MUST be made no sooner than one hundred eighty (180) days and no later than sixty (60) days prior to the expiration of the permit.

The expiration date of this permit is five (5) years from the date of the signature of the Secretary or his designee.

Upon expiration of this permit, a new Coastal Use Permit will be required for completion of any unfinished or uncommenced work items and for any maintenance activities involving dredging or fill that may become necessary. Other types of maintenance activities may also require a new Coastal Use Permit.

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C.O.E. No.: MVN- 2010- 0973- WLL



By accepting this permit the applicant agrees to its terms and conditions. I affix my signature and issue this permit this 25th day of August, 2010.

THE DEPARTMENT OF NATURAL RESOURCES

Karl L. Morgan, Acting Administrator Office of Coastal Management

Karl L May

This agreement becomes binding when signed by Administrator of the Office of Coastal Management Permits/Mitigation Division, Department of Natural Resources.

Attachments

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C.U.P. No.: P20100399

C.O.E. No.: MVN- 2010- 0973- WLL



#### **Final Plats:**

1) P20100399 Final Plats 06/21/2010

cc: Pete Serio, COE w/attachments
Dave Butler, LDWF w/attachments
Lynn Hohensee, WCalcP w/attachments
Ernest Broussard, WCamPC w/attachments
Channing Hayden, Jr., PortLC w/attachments
Stephen Broussard, LED w/attachments
Peggy Rooney, OCM w/attachments
Kaili Mills, OCM/FI w/attachments
Cameron Parish w/attachments

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(PANVATE AIDS SECTION)

## **APPENDIX B**

Preconstruction Conference Report, Meeting Minutes, Armor Unit Inspection Reports, and Construction Site Visit Reports

# PRE-CONSTRUCTION CONFERENCE Meeting Minutes

# Bio-Engineered Oyster Reef Demo Project (LA-08)

Date: July 28, 2011

Meeting Start: 10 am

Attendees: see attached sign-in sheet for phone and email.

Office of Coastal Protection and Restoration (OCPR): Darrell Pontiff (DP), Tye Fitzgerald

(TF), Dion Broussard (DB), Mel Guidry (MG), Stan Aucoin (SA)

Aquaterra (AT): Blake Dwoskin (BD), David Wiseman (DW)

Coast and Harbor Engineering (CHE): Josh Carter (JC)

National Oceanic and Atmospheric Administration (NOAA): Dr. John Foret (JF)

Louisiana Department of Wildlife and Fisheries (LDWF): Kim Bourriaque (KB)

**ORA Engineering:** Tyler Ortego (TO)

Hunt, Guillot, and Associates (HGA): Bill Blankenship (BB)

#### 1. INTRODUCTION

Discussion by **DP** 

- A. This is the pre-construction conference for the "Bio-Engineered Oyster Reef Demo Project (LA-08)."
- B. All parties in attendance introduced themselves. Attendance list is signed by all and is attached.
- C. The project is being funded by CWPPRA funds.
- D. The project consists of providing all labor, equipment and materials to perform the Base Bid work shown in the Contract Documents including installation of approximately 1,242 OsyterBreak Armor units along with 18,060 SF of marine mattress foundation.

#### 2. FEDERAL AGENCY

Discussion by **DP** 

National Marine Fisheries Service (NMFS) Dr. John Foret, PhD. (337) 291-2107

#### 3. STATE AGENCY

#### Discussion by **DP**

A. Louisiana Coastal Protection and Restoration Authority / Office of Coastal Protection and Restoration (CPRA/OCPR)

Project Manager – Ken Bahlinger (225) 342-7362

Project Engineer – Tye Fitzgerald, E.I. (225) 342-4496

Construction Manager – Darrell Pontiff, P.E. (337) 482-0683

Construction Manager – Dion Broussard, E.I. (337) 482-0686

B. Louisiana Department of Wildlife and Fisheries

Refuge Manager – Tom Hess (337) 491-2593

Facilities Maintenance Manager - Kim Bourriaque (337) 491-2593

#### 4. ENGINEER

#### Discussion by **DP**

Coast and Harbor Engineering (Construction Oversight)

3410 Far West Blvd., Suite 210, Austin, TX 78731

Project Manager – Josh Carter, P.E. (512) 342-9707 (o); (512)-289-3857 (m)

Project Inspector – Casey Connor, P.E. (512) 777-3062 (o); (321)-960-1539 (m)

Hunt, Guillot and Associates (Davis-Bacon Administration)

8555 United Plaza Blvd, Suite 110

Baton Rouge, LA 70809

Project Manager – Bill Blankenship (225) 927-6825 (office)

#### 5. NOTICE TO PROCEED

#### Discussion by **DP**

- A. The notice to proceed was mailed to Aquaterra Contracting, LP on July 19, 2011 with the actual Notice to Proceed date of August 2, 2011. No site work can start until the August 2, 2011 date.
- B. Contract time starts on August 2, 2011. Time to complete the contract is 210 calendar days, with liquidated damages of \$1,500.00 per calendar day for any work that remains uncompleted after the contract time specified. The contract completion date is February 28, 2012.
- C. Project communication protocol / lines of authority.
  - Communication should flow from AT to CHE to OCPR.
  - AT provided a list of contacts at AT, both for normal operations and emergency contact numbers (list attached to minutes).

#### 6. CONTRACTOR REPRESENTATIVES

#### Discussion by **DP**

- A. Project Manager Blake Dwoskin, (281) 330-8114 (m)
- B. Project Superintendent David Wiseman, (386) 566-2823 (m)
  Backup Project Superintendent Thomas Gruber, (361) 533-3805 (m)
- C. QA/QC Superintendent David Wiseman, Thomas Gruber [not discussed at meeting; information supplied after meeting]

#### 7. SUB CONTRACTORS

#### Discussion by **DP**

- x Applicable to this projectNot Applicable to this project
- A. Tensar International
- B. Survey unidentified at this time
- C. The Contractor agrees that he is as fully responsible to the Owner for the acts and omissions of his Subcontractors and of persons indirectly employed by him as he is for the acts and omissions of persons directly employed by him. The Contractor shall be responsible for the coordination of the trades, Subcontractors, materials, and men engaged upon his work. The Owner and Engineer will not undertake to settle any differences between the Contractor and his Subcontractors or between Subcontractors. The Contractor shall cause appropriate provisions to be inserted in all Subcontracts relative to the work to bind Subcontractors to the Contractor by the terms of the General Conditions.

#### 8. ENVIRONMENTAL PROTECTION

#### Discussion by **DP**

The Contractor shall take all necessary measures to control air, soil or water pollutants. All chemical pollutants such as drained lubricating oil/water, grease, soaps are to be disposed of off site in accordance with Federal, State and Local regulations. Soils contaminated with petroleum products will be removed from the site and disposed of in accordance with State and Local regulations. The Contractor will do no burning. Remember that all work sites are located in environmentally sensitive areas. Refer to GP-27, "Project Site Clean-up" and GP-32, "Control of Siltation and Water Pollution," for additional requirements.

#### 9. SHOP DRAWINGS AND CERTIFICATES OF COMPLIANCE

#### Discussion by **DP**

The Contractor shall furnish shop drawings of all the assemblies requiring fabrication. Shop drawings shall be submitted in six copies, two copies of which will be returned, approved or corrected. Any certificates required for demonstrating proof of compliance of materials with specifications requirements shall be executed in three copies. Each certificate shall be signed by an official authorized to certify in behalf of the supplying company and shall contain the name and address of the Contractor, the project name and location, and the quantity and date or dates of shipment or delivery to which the certificates apply. Copies of laboratory test reports submitted with certificates shall contain the name and address of the testing laboratory and the date or dates of the tests to which the report applies. All submittals must be certified by the Contractor before submission. Failure to comply will result in rejection of the submittal.

#### 10. CHANGES IN THE WORK, CONTRACT TIME AND PRICE

#### Discussion by **DP**

Changes in work, contract prices and contract time can only be changed by a written "Change Order." Refer to GP-42, GP-43 and GP-44.

#### 11. SANITARY AND SAFETY PROVISIONS

#### Discussion by **DP**

The Contractor shall provide and maintain sanitary accommodations for use by his employees and Subcontractors. Facilities shall comply with the requirements of the local and State Board of Health and of other authorities having jurisdiction.

The Contractor shall observe all rules and regulations of the State Board of Health, or any bodies having jurisdiction, and of all local health officials and must take precautions as are necessary to avoid unhealthy conditions. After the JSSP has been approved all personnel will be required to follow all safety rules and regulations. Review paragraph GP-21 'Accident Prevention, Investigations and Reporting", which outlines accident reporting requirements.

BD provided copies of the Safety Plan as a submittal during the meeting.

#### 12. REPORTS, RECORDS AND MEETINGS

#### Discussion by **DP**

The Contractor shall furnish to the Engineer daily progress reports of the work including Contractor's compliance with the approved progress schedule and current schedule of submittals. The Engineer will furnish Owner's Construction Manager a weekly report on progress of the work. The Engineer will schedule and hold meetings as needed to

properly administer the project. The Engineer will preside at the meetings and provide for keeping and distribution of the minutes.

#### 13. INSPECTION AND ACCEPTANCE

#### Discussion by **DP**

Engineer will make inspections with the Owner and Contractor. This can be a partial completion for progress payments. Final Inspection and Acceptance will be done after a written notice from the Contractor that all the work is complete. The Engineer will make an inspection with the Owner and Contractor and notify the Owner in writing of the acceptance of the inspection which shall be considered the final inspection.

#### 14. AS-BUILT DRAWINGS

#### Discussion by **DP**

The Contractor shall keep an accurate as-built record, in a manner approved by the Engineer, of all changes in the Contract Documents during construction. All revisions shall be shown in red and be easily distinguishable from the original design. Final payment will not be received until the As-Built Survey and Work have been accepted by the Engineer. Refer to GP-54 "As-Built Drawings" & TS-7.5E "Post Construction Survey".

#### 15. DAVIS BACON ACT

#### Discussion by **DP**

The Contractor shall abide by laws set forth in the Davis-Bacon Act of 1931 which states that all laborers and mechanics employed by recipients, the recipient's contractors, or subcontractors on this project shall be paid wages at rates no less than those prevailing on projects of a character similar in the locality as determined by the Secretary of Labor in accordance with subchapter IV of chapter 31 of Title 40 United States Code. Refer to GP-4 "Laws, Regulations, Standards, Specifications, and Codes".

Further detailed discussion of Davis-Bacon compliance was differed to the end of the meeting (see Item 20).

#### 16. PAYMENTS

#### Discussion by **DP**

Progress payments will be made on the first of the month and in accordance with the Measurement and Payment Provisions included in the Technical Specifications and the General Provisions of the Contract Documents. Progress Payments will be based on the contract price of labor and materials incorporated in the work and of materials suitably stored at the site, as estimated by the Engineer, less the aggregate of previous payments. Contract retainage of five (5%) of the payment amount will be withheld from each

Progress Payment. Upon substantial completion of the entire work, a sum sufficient to increase the total payment to ninety-five percent (95%) of the total contract price (less cost for demobilization and "punch-list" items, as applicable) will be approved.

#### 16. INVOICING

#### Discussion by **DP**

Invoices will be submitted to the Engineer for processing and forwarding to the Construction Manager. The PO number shall appear on all correspondence. For reference, the PO number is: **PO** # **3726092**, **File** #: **R28059DL** 

#### 17. CAUTION NOTES

#### Discussion by **DP**

Be sure and call: Louisiana One Call at 1-800-272-3020 forty eight hours prior to digging or spudding, **IT'S THE LAW!** 

#### 18. REVIEW OF THE TECHNICAL PLANS AND SPECIFICATIONS

**JC** reviewed the technical plans and specifications with the Contractor and meeting participants. Discussion included:

#### 18.1. Submittals

- Each submittal shall include a transmittal letter that indicates project title, state project number, contract number, date of submittal, submittal number, Specification reference from which the submittal was required, and a signed statement by the contractor that it complies with Contract requirements with any exceptions explicitly listed.
- o Each submittal requires four (4) copies (only 1 original) plus number contractor needs for their records. Four (4) copes will be retained by Engineer and Owner, and remainder will be returned to Contractor. Summary of number of Submittals:
  - 2 Copies required for Engineer2 Copies required for Owner
  - 2 Copies required for Contractor

#### 6 Total Copies required for each submittal

- o TS 5.8 Summaries required submittals in addition to those in GPs and SPs.
- O **BD:** included in submittals today a copy of the proposed contractor's daily report. **DW** asked at what frequency should these reports be submitted? **JC** responded that as frequently as possible is best; must submit at least 1 time per week and include a report from each day for the preceding week.

#### 18.2. Work Items

- Manufacture and delivery of units
- o Dredging access channel (if required).
- Assembly and placement of Marine Mattress
- o Placement of Oysterbreak Armor Units
- o Quality Control Testing
- o Surveying
- o Installation of Navigation Aids

#### 18.3. NTP vs Notice to Mobilize

- o NTP initiates:
  - Initiation of Manufacturing and Delivery of units
  - Pre-Construction, Staking and Magnetometer Surveys
- o Manufacture to be completed 90 days from NTP; final acceptance of units with testing and inspection 120 days from NTP
- o NTM initiates, after at least 33% of units accepted:
  - Dredging access channel (if required)
  - Assemble, fill, and place marine mattress
  - Install Oysterbreak Armor Units
  - Install Navigation Aids

#### 18.4. Permits

o Contractor must abide by all conditions listed in Permits (see Appendix C)

#### 18.5. Manufacture and delivery of Oysterbreak Armor Units

- o TS 10.5-A: Manufacturer: Wayfarer Environmental Technologies LLC (WET)
- o 668 bottom units (pegless): 334 oysterkrete, 334 Normal Weight Concrete
- o 574 top units (with pegs): 287 oysterkrete, 287 Normal Weight Concrete
- o Oysterbreak Armor Units must meet performance requirements in TS 10.6-B
- o QC Testing is required during manufacturing as per TS 10.5-C and 10.5-D
  - Compressive Strength 7/14/21/28 days per ASTM C39
  - Slump (or similar)
  - Unit Weight
  - Air Content
  - Concrete Temperature
  - above tests performed for every 25 CY of concrete poured
  - Tensile Strength; only required at first and last batch
- O Acceptance inspections: Engineer will perform up to 3 at manufacture plant. Prior to acceptance inspections, QC test results for units to be inspected must be received by the Engineer. Inspections requested of Engineer in excess of 3 will be paid by the Contractor at no additional expense to Owner.
- o Delivery: Units to be delivered to contractor use area shown on Plans, Sheet 3, or other location approved by Engineer.
- o **BD** stated that he expects to deliver the units to the Contractor Use Area shown on the Plans, except for 1 shipment which they will send to their yard for experimentation for handling.

- o Handling, Shipping, and Transportation of Units specified in TS 10.15 and 10.16.
- o **Acceptance** of units for payment under Bid Items 3 and 4 will not occur until units have been delivered to contractor use area (or approved equivalent) and reviewed by Engineer or Owner.

#### 18.6. Site Access

- Access to project site via private property (Sturlese Property); must coordinate prior to use as per Tech Specs.
- Notice to Mariners from US Coast Guard prior to any marine activity (see Permits)
- Access Channel Dredging
  - must comply with conditions of Permits in Appendix C
  - Mark spoil as required in Plans and per US Coast Guard requirements
- o **BD** noted that they plan to not dredge, and instead light-load their barges to get access.
- o No access to land at breakwater site
- o Provide Owner access to site via boat, and provide workspace for the Engineer at the Contractor's Construction Office
  - **BD** stated that a crew tug will be used for office space, and **AT** will provide space for the Engineer and Owner in that office.
  - **BD** stated **AT** will have a vessel at the disposal of the Engineer and Owner to provide access from the dock to the work site.
  - BD asked to have a day or two of notice prior to arrival so AT can prepare.
- o **KB** discussed several items:
  - There are rules for working at the Refuge; a summary of rules were provided and area attached to the meeting minutes.
  - Boat ramp construction is scheduled to start sometime in September. It will not likely interfere with AT operations
  - **KB** emphasized that **AT** must contact Mr. Sturlese soon to access the contractor use area.
  - OCPR stated that AT must contact Kim prior to any operations or work starting at the Refuge.

#### 18.7. Oysterbreak Armor Unit Installation

- o Prepare site; minimize disturbance to natural bottom if possible.
- o Breakwater A: Oysterkrete Units; Breakwater B: Normal Weight Concrete Units
- o First 50 ft installed in presence of Engineer and Manufacturer.
- o Placement in pattern shown on plans; see TS 10.18
- o Ends of breakwaters in pattern shown on Plans, Detail 8 on Sheet 6
- Accepted for payment based on number (each) place to lines and grades verified by surveys

#### 18.8. Marine Mattress

- o Materials: See TS 11.7:
  - Triton Gabion Mats by Tensar (or approved equivalent)

- non-woven geotextile (Tencate Mirafi S1600 or approved equivalent)
- Stone Fill as per TS 11.7-H, 4" minus gradation.
- o Seams and mechanical connections as specified in 11.9-B and 11.9-C
- o Filling as per 11.9-D: fill mats using lifts, compact after each lift
- o place with a minimum 2 ft overlap of geotextile for next mattress to lay on
- o Construct no more than 50 ft of exposed mattress along stationing (mattress without units placed on them), unless otherwise approved.

#### 18.9. Surveying

- o Pre-Construction Survey, Initial Monitoring Survey, & Staking: Completed 45 to 14 days prior to construction
- o Magnetometer Survey: Completed 45 to 14 days prior to construction
- o Structure alignment, location, and location of channel and navigation aids may change based on Pre-Construction and Magnetometer surveys
- o Construction Surveys: Specific survey pattern across structure on a survey profile line
- o Post-Construction Surveys: Completed 5 days after substantial completion
- o Monitoring Surveys
  - Initial Monitoring Survey, Sheet 10 for layout
  - Final Monitoring Survey, Sheet 11 for layout
  - Can include surveys from Pre-Construction and Post-Construction Surveys (i.e. can be performed at the same time and use the same overlapping data where possible)
- o **BD** stated that the surveying subcontractor has not yet been selected and that an additional pre-construction meeting may be needed. **JC** agreed that another meeting should be help, perhaps by conference call. **BD** stated they have tentatively scheduled a second meeting for 8/17.

#### 18.10. Questions on Technical Aspects

- o **BD** requested a copy of the plans as AutoCAD files in order to more easily lay out their work, and a clean, printable PDF copy of the Contract Plans. **JC** stated **CHE** should be able to provide and to please request via email.
- O BD asked if they could first install the Normal Weight Concrete (NWC) Breakwater, Breakwater B, prior to installing Breakwater A, the Oysterkrete Breakwater. JC stated that starting with either is ok, but the construction should progress sequentially without gaps (i.e. do not install a portion of one breakwater and then start on the other breakwater prior to completing the breakwater that was started). JC stated this question should be posed in writing as a Request for Information (RFI) as it modifies the Contract Documents.
- o **TO** asked if river rock can be used in place of crushed limestone for the aggregate of the NWC units. **JC** stated there does not seem to be a problem with that, but requested the question to be submitted as a RFI.
- o **TO** asked if the initial submittals discussing fabrication and units were required to be reviewed prior to starting fabrication of the Oysterbreak Armor Units. **JC** responded no, it is not required. However, any units fabricated in a manner that

was rejected by subsequent submittals would be required to be discarded and refabricated to meet reviewed methods and submittals.

#### 19. Schedule

BD discussed the schedule:

- **BD:** AT's schedule as presented is based on working a 6-day work week with 12 hours shifts, with only 1 shift per day.
- **BD:** With current proposed schedule, work is completed 19 days prior to end of contract time (2/28/2011).
- **BD:** anticipate a supplemental pre-construction conference to be held 8/17
- **BD:** anticipate Notice to Mobilize sometime in October. currently scheduled for 10/27
- **DP:** noted that if more time is needed and can be justified, it can be added to the contract time. **JC** noted that the date and reasons for additional time should be requested as they occur, and not at the end of the project for an event that occurred earlier on.

#### 20. Further Discussion of DAVIS BACON ACT (BB)

- **BB** passed out the Guide to Completing Payrolls for federally funded projects subject to Davis-Bacon (D-B) compliance
- **BB** discussed D-B compliance procedures:
  - o **AT** must post D-B employment rights sign in a clearly visible space in the contractor's office in the field at the work site.
  - o **BB** asked about AT's subs; they include a surveyor and Tensar. Neither of these qualify for D-B. So only **AT's** employees qualify
  - o **BD** stated that 10 or less laborers will be used on site.
  - o **AT** should send payroll directly to **HGA** (Karen Carlton in Ruston LA; see guide book for details) for review.
  - o Primary contact for **AT** at **HGA** will be Karen Carlton. However, if issues arise that cannot be resolved with Karen, **BB** will be the contact.
  - o **BD**: **AT** payroll is weekly, Monday through Sunday. BB stated that AT has 7 days from end of payroll to submit to HGA for review.
  - o HGA will check AT's payroll weekly for compliance. On a monthly basis, HGA will submit an Error Report to AT and copy CHE and OCPR. HGA will work with AT to resolve the errors. At end of project OCPR cannot pay retainage until all errors have been resolved.
  - O At final completion of project and after resolution of any errors, **HGA** will compile all D-B compliance documentation and submit to **CHE** and **OCPR**.
- **BB** will conduct 3 rounds of employee interviews at the site. As the site is located offshore, **BB** will schedule a time to attend with **CHE** so he can gain access to the workers and still keep the interviews unscheduled with the contractor.

- **BB** discussed fringe benefits with regards to Overtime Pay. **BD** stated that fringe benefits are included as cash in the employees pay. **BB** noted that for D-B, overtime is calculated as the hourly wage without fringe benefits x 1.5 + fringe benefits.
- **BB** requested a contact at AT for payroll discussions. BD provided the contact: Brenda Berry (972) 869-9008 bjb@aquaterracontracting.com
- **BB** stated that if **AT** anticipates needed additional wave classifications, **HGA** will review the proposed classification and wages, then **AT** will submit the request to the Department of Labor. Approval takes approximately 2 to 3 weeks.

Meeting adjourned at 11:45 am

## **BIO-ENGINEERED OYSTER REEF PROJECT (LA-08)**

## PRE-CONSTRUCTION CONFERENCE

DATE: July 28, 2011

NAME	AFFILIATION	PHONE NO.	E-MAIL ADDRESS	
DARKEN PONTIFE	ocer	387 482-0683	darrell.puntitle la.gov	İ
Josh Carter	CHE	512 342 9707	josh@coastherboreug.com	è
Kim BOURRIAQUE	LOWF	337-794-9085	Kbourringue OD WIF. Instead	
Type Fitzgeraddd.	OCPX	225-342-4496	typ. f. +zdem dela, dov	
Tylen Onxego	ONA Eginen	225-229	type fitzgen dela gov type coratechnologie	نه. در
Bil Blankenshys	HG.4	225-927-6825	wblenkenship Ohgo-16, com	
FLAKE DIMOSILIH	AGUATERRA	281-330-8114	bdwookineagoaterracontm	
David Wiseman	QUATERNA	386-566-3833	CANTONIO WISEMAN @	
JOHN FORET	NOAH/NMES		JOHN. FORETCE NOAA. GOV	
Dion Browseard	OCPR		dion. browssard@la.gov	
MEL GUIDRY	OCPR		MELVIN, GUIDPY DLA. GOU	
SAM AUCOZU	OCPR	337-482-0681	STANCET, AUCODI RLA. GOV	
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#### ROCKEFELLER WILDLIFE REFUGE

5476 Grand Chenier Highway Grand Chenier, Louisiana 70643 Phone: 337-491-2593

## **Contractor Work Regulations**

Refuge property connects to Highway 82 in three sites i.e. Price Lake Road at the western boundary, Headquarters, and East Locks Road. Other land access is through neighboring properties which the Department has servitudes/agreements with landowners for routine refuge activities from Highway 82. Contractors seeking entrance are to contact these landowners:

## Joseph Harbor Boat Launch and Bulkhead

If access is needed to Joseph Harbor Boat Launch and Bulkhead they are to contact Mr. Richard Sturlese (337-278-0119 / 337-993-0962).

## Superior Canal Boat Launch

Access to the Superior Canal Boat Launch is to be obtained from Mr. Chad Courville, Land Manager for Miami Corporation (337-264-1695 / 337-344-4252). There is a locked gate and with Mr. Courville's permission the LDWF Rockefeller Refuge Program Manager can provide a key. Also, at this site boat access to the refuge is through Miami Corporation and Marilyn Miller Properties. Permission to cross the Miller Properties is to be obtained from Mr. J. C. Theriot (979-798-4699 / 979-299-2488).

## Rockefeller Management Unit 14 Area - Eastern Property Line Canal Area

Entrance to the Rockefeller Management Unit 14 area and Eastern Property Line Canal area is across private property managed by Mr. David Richard (337-433-1055 ext. 119). With Mr. Richard's permission the Rockefeller Refuge Program Manager will issue a key for passage.

## Rockefeller East Property Line Road

Road access along the Rockefeller East Property Line Road is through Mr. Martin Richard's property (504-887-2143) and with Mr. Richard's permission the program manager can provide access.

## Rollover Canal and eastern portion of the Refuge

A private Boat Launch at Pecan Island, Soustan's landing may be used to access Rollover Canal and the eastern portion of the Refuge.

## Gulf of Mexico - Intercoastal Canal

Boat access from the Gulf is through Rollover Canal and Joseph Harbor. Entrance from the Intracoastal Waterway is through Grand Lake and Superior Canal. Contact will need to be with Mr. Chad Courville (337-264-1695 / 337-344-4252) and J. C. Theriot (979-798-4699 / 979-299-2788) regarding the Superior Canal as it crosses Miami Corporation and Marilyn Miller Properties. LA DOTD (337-538-2551) needs to be contacted for passage through the Highway 82 swing bridge.

# Contractors are to comply with all rules and regulations of the Louisiana Department of Wildlife and Fisheries and Rockefeller Wildlife Refuge including the following:

- Normally work can begin at any time during the year and there are no Refuge closures that would stop work due to waterfowl migration onto the Refuge. Work could be delayed due to Parish closures caused by Tropical Storms or Hurricanes, or periodic refuge research or management activities. Contractors are to confirm with the Rockefeller Program Manager.
- The contractor must notify the Program Manager at least 7 days in advance of the project start date and schedule a meeting to discuss the project and Refuge Rules and Regulations.
- Work can normally be conducted on the Refuge 24 hours per day/seven days per week. There are no restrictions on work time for this project. Contractor must provide adequate safety measures to protect recreational boaters. Employees must have proper identification in possession while on the refuge and be prepared to display same as requested.
- Project work sites will be temporarily closed to the public to assure public safety if necessary.
- Equipment and supplies may be loaded from several landings on the Refuge. Boat access onto the Refuge and loading will be coordinated through the Program Manager.
- Large work boats and crew boats will be required to idle to and from job sites. The entire area is a NO WAKE ZONE. LDWF encourages the use of small boats to reduce levee erosion.
- Bringing firearms, bows and arrows, liquor and controlled dangerous substances (drugs) onto the Refuge is prohibited.
- Personnel are not permitted to fish, crab, shrimp, etc. while working on the project.
- All trash, debris, or hazardous materials generated during the project must be disposed offsite following all federal, state, and local regulations.
- The Program Manager is to be notified immediately of any accidents, injuries, spills, etc. (see attached emergency contact list).

## ROCKEFELLER WILDLIFE REFUGE EMERGENCY AND SUPPORT LISTINGS

Rockefeller Wildlife Refuge, 5476 Grand Chenier Highway, Grand Chenier, Louisiana 70643 Office Phone: 337-491-2593 Office Fax: 337-491-2595

Guthrie Perry, Program Manager	337-853-4077 Cell
Tom Hess, Biologist Manager	337-802-5997 Cell
Brac Salyers, Biologist Supervisor	
**************************************	
Kim Bourriaque, Facilities Maintenance Manager	33'/-'/94-9085 Cell
Jubal Marceaux, Captain Region V, Enforcement Division	337-491-2588 Office
,我们就是我们的,我们就是我们的,我们就会会会会会会会会会会会会会会会会会会会会会会会会会会会会会会会会会会会会	337-577-3197 Cell
	<u>jmarceaux@wlf.la.go</u>
EMERGENCY	
Air Med	1-800-259-1234
Ambulance Service, Cameron	337-775-5111 or 911
Cameron Parish Volunteer Fire Department	337-775-5111 or 911
Cameron Parish Sheriff's Department	337-775-5111 or 911
Sheriff Theos Duhon	337-775-5714
P. O. Box 1250, Cameron, LA 70631	
SUPPORT	
Waste Management, Jake Philmon	337-436-7229
536 Wesley Road, Lake Charles, LA 70607	•
Wilkerson Scrap	337-436-7146
O Box 19037, Lake Charles, LA 70616	
Port-O-Let of LA LLC, Lauri Jones	504-394-8983
9486 Highway 23, Belle Chase, LA 70037	
Kentwood Water	337-494-7533
1810 E. Opelousas St., Lake Charles, LA 70615	
Cameron Parish Mosquito Control, Josh Hightower, Director	337-775-5942
43 LeBlanc Road, Creole, LA 70632	
GROCERY/GENERAL MERCHANDISE/RESTAURANTS	
Kelley's Mart, LLC, 3261 Grand Chenier Hwy, Grand Chenier, LA 7	06/3327.538.260/
Booth's Grocery, 5657 Grand Chenier Hwy, Grand Chenier, LA 7064	
<b>Grows Cajun Grill,</b> 4409 Creole Hwy, Creole, LA 70632	
. 20, 5 Oujum Gran, 1107 Crook Hilly, Clock, 121, 10032-1	
CHURCHES	
Const Charles Made dist Character Co. 102 1 17 1 C. 102	01 ' 1 4 70 4 40
Grand Chenier Methodist Church, Grand Chenier Highway, Grand Chenier	

St. Eugene Catholic Church, 5035 Grand Chenier Hwy, Grand Chenier -----337-538-2245

## AquaTerra Contracting LP

11498 Luna Road, Suite 106 Dallas, TX 75234

Phone: (972) 869-9008 Fax: (972) 869-4005

July 28, 2011

To: Darrell Pontiff P.E.

Office of Coastal Protection & Restoration

Operations Branch 337-482-0683

Re:

Bioengineered Oyster Reef Demonstration Project (LA-08)

File Number: R 28059 DL Telephone Numbers

As requested, please see the following telephone numbers for the Home Office, Field Location and Emergency communications:

#### Home Office

- 972-869-9008 ext. 221 (phone)
- 972-869-4005 (fax)
- bdwoskin@aguaterracontracting.com (Blake Dwoskin email)
- <u>bjb@aquaterracontracting.com</u> (Brenda Berry email)

#### **Field Contacts**

- David Wiseman Project Superintendent: 386-566-2823 (cell), dwiseman@aquaterracontracting.com (email)
- Thomas Gruber Project Superintendent: 361-533-3805 (cell), tgruber@aquaterracontracting.com (email)

#### **Emergency Contact Phone Numbers**

David Wiseman, Project Superintendent: 386-566-2823 (cell)
 Thomas Gruber, Project Superintendent: 361-533-3805 (cell)
 Blake Dwoskin, Project Manager: 281-330-8114 (cell)
 Brenda Berry, Office Administrator: 361-533-0636 (cell)

## PRE-CONSTRUCTION CONFERENCE (Supplemental 1) Meeting Minutes

## Bio-Engineered Oyster Reef Demo Project (LA-08)

Date: August 17, 2011

Meeting Start: 330 pm

**Attendees:** 

Office of Coastal Protection and Restoration (OCPR): Darrell Pontiff (DP),

Aquaterra (AT): Blake Dwoskin (BD), David Wiseman (DW)

Coast and Harbor Engineering (CHE): Josh Carter (JC), Casey Connor (CC)

Fensetermaker: Rene Estere (RE), Greg Palmer (GP), Bob Lestaps (BL)

**Tensar:** Jeff Fisk (JF)

#### 1. INTRODUCTION

Discussion by **DP** 

- A. This is the pre-construction conference for the "Bio-Engineered Oyster Reef Demo Project (LA-08)."
- B. All parties in attendance introduced themselves.
- C. The project is being funded by CWPPRA funds.
- D. The project consists of providing all labor, equipment and materials to perform the Base Bid work shown in the Contract Documents including installation of approximately 1,242 OsyterBreak Armor units along with 18,060 SF of marine mattress foundation.

## 2. FEDERAL AGENCY

Discussion by **DP** 

National Marine Fisheries Service (NMFS) Dr. John Foret, PhD. (337) 291-2107

## 3. STATE AGENCY

Discussion by **DP** 

A. Louisiana Coastal Protection and Restoration Authority / Office of Coastal Protection and Restoration (CPRA/OCPR)

Project Manager – Ken Bahlinger (225) 342-7362

Project Engineer – Tye Fitzgerald, E.I. (225) 342-4496

Construction Manager – Darrell Pontiff, P.E. (337) 482-0683

Construction Manager – Dion Broussard, E.I. (337) 482-0686

B. Louisiana Department of Wildlife and Fisheries
 Refuge Manager – Tom Hess (337) 491-2593
 Facilities Maintenance Manager - Kim Bourriaque (337) 491-2593

#### 4. ENGINEER

Discussion by **DP** 

Coast and Harbor Engineering (Construction Oversight)

3410 Far West Blvd., Suite 210

Austin, TX 78731

Project Manager – Josh Carter, P.E. (512) 342-9707 (office)

Project Inspector - Casey Connor, P.E. (512) 777-3062 (office)

Hunt, Guillot and Associates (Davis-Bacon Administration)

8555 United Plaza Blvd, Suite 110

Baton Rouge, LA 70809

Project Manager – Bill Blankenship (225) 927-6825 (office)

#### 5. NOTICE TO PROCEED

Discussion by **DP** 

- A. The notice to proceed was mailed to Aquaterra Contracting, LP on July 19, 2011 with the actual Notice to Proceed date of August 2, 2011. No site work can start until the August 2, 2011 date.
- B. Contract time starts on August 2, 2011. Time to complete the contract is 210 calendar days, with liquidated damages of \$1,500.00 per calendar day for any work that remains uncompleted after the contract time specified. The contract completion date is February 28, 2012.
- C. Project communication protocol / lines of authority.

## 6. CONTRACTOR REPRESENTATIVES

Discussion by **DP** 

- A. Project Manager Blake Dwoskin, (281) 330-8114 (m)
- B. Project Superintendent David Wiseman, (386) 566-2823 (m)
  Backup Project Superintendent Thomas Gruber, (361) 533-3805 (m)
- C. QA/QC Superintendent David Wiseman, Thomas Gruber

## 7. SUB CONTRACTORS

Discussion by **DP**<u>x</u> Applicable to this project

Not Applicable to this project

- A. Fensetermaker
- B. Tensar
- C. The Contractor agrees that he is as fully responsible to the Owner for the acts and omissions of his Subcontractors and of persons indirectly employed by him as he is for the acts and omissions of persons directly employed by him. The Contractor shall be responsible for the coordination of the trades, Subcontractors, materials, and men engaged upon his work. The Owner and Engineer will not undertake to settle any differences between the Contractor and his Subcontractors or between Subcontractors. The Contractor shall cause appropriate provisions to be inserted in all Subcontracts relative to the work to bind Subcontractors to the Contractor by the terms of the General Conditions.

#### 8. ENVIRONMENTAL PROTECTION

Discussion by **DP** 

The Contractor shall take all necessary measures to control air, soil or water pollutants. All chemical pollutants such as drained lubricating oil/water, grease, soaps are to be disposed of off site in accordance with Federal, State and Local regulations. Soils contaminated with petroleum products will be removed from the site and disposed of in accordance with State and Local regulations. The Contractor will do no burning. Remember that all work sites are located in environmentally sensitive areas. Refer to GP-27, "Project Site Clean-up" and GP-32, "Control of Siltation and Water Pollution," for additional requirements.

#### 15. DAVIS BACON ACT

Discussion by **DP** 

The Contractor shall abide by laws set forth in the Davis-Bacon Act of 1931 which states that all laborers and mechanics employed by recipients, the recipient's contractors, or subcontractors on this project shall be paid wages at rates no less than those prevailing on projects of a character similar in the locality as determined by the Secretary of Labor in accordance with subchapter IV of chapter 31 of Title 40 United States Code. Refer to GP-4 "Laws, Regulations, Standards, Specifications, and Codes".

#### 17. CAUTION NOTES

Discussion by **DP** 

Be sure and call: Louisiana One Call at 1-800-272-3020 forty eight hours prior to digging or spudding, **IT'S THE LAW!** 

## 18. REVIEW OF THE TECHNICAL PLANS AND SPECIFICATIONS

Discussion by **JC** 

#### 18.1. Submittals

- Each submittal shall include a transmittal letter that indicates project title, state project number, contract number, date of submittal, submittal number, Specification reference from which the submittal was required, and a signed statement by the contractor that it complies with Contract requirements with any exceptions explicitly listed.
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  - 2 Copies required for Engineer
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## 6 Total Copies required for each submittal

- o **JC**: If subconsultant requires additional copies, subconsultant shall provide AT with those copies for submittal to CHE.
- TS 5.8 Summaries required submittals in addition to those in GPs and SPs.

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- o Dredging access channel (if required).
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- o Installation of Navigation Aids

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#### 18.4. Permits

o Contractor must abide by all conditions listed in Permits (see Appendix C)

#### 18.5. Site Access

- o Access to project site via private property (Sturlese Property); must coordinate prior to use as per Tech Specs.
- Notice to Mariners from US Coast Guard prior to any marine activity (see Permits)
- o No access to land at breakwater site, except for surveying by foot
- o Refuge Rules:
  - There are rules for working at the Refuge; a summary of rules were provided and will be attached to the meeting minutes.
  - Refuge (Kim Bourriaque: 337-794-9085) must be contacted at least 2 days prior to any operations or work starting at the Refuge.

## 18.6. Oysterbreak Armor Unit Installation

o **Accepted** for payment based on number (each) place to lines and grades verified by surveys

#### 18.7. Marine Mattress

- o Materials: See TS 11.7:
  - Triton Gabion Mats by Tensar (or approved equivalent)
  - non-woven geotextile (Tencate Mirafi S1600 or approved equivalent)
  - Stone Fill as per TS 11.7-H, 4" minus gradation.
- o Seams and mechanical connections as specified in 11.9-B and 11.9-C
- o Filling as per 11.9-D: fill mats using lifts, compact after each lift
- o place with a minimum 2 ft overlap of geotextile for next mattress to lay on
- Construct no more than 50 ft of exposed mattress along stationing (mattress without units placed on them), unless otherwise approved.
- o **JF** stated the test to show resistance to installation damage can only be accomplished in the field. **JF**'s experience is that results are typically much higher than the specified 85%. **JC** requested that **JF** or **AT** should provide some narrative describing how they can assure compliance with the specification for **CHE** review.

#### 18.8. Surveying

- Pre-Construction Survey, Initial Monitoring Survey: Completed 45 to 14 days prior to construction
- o Magnetometer Survey: Completed 45 to 14 days prior to construction
- Structure alignment, location, and location of channel and navigation aids may change based on Pre-Construction and Magnetometer surveys
- Construction Surveys: Specific survey pattern across structure on a survey profile line
- o Post-Construction Surveys: Completed 5 days after substantial completion
- Monitoring Surveys

- Initial Monitoring Survey, Sheet 10 for layout
- Final Monitoring Survey, Sheet 11 for layout
- Can include surveys from Pre-Construction and Post-Construction Surveys (i.e. can be performed at the same time and use the same overlapping data where possible)
- RE stated that the accuracy stated in TS 7.5-A.11 is mistaken; no equipment is made that is possible to achieve that level of accuracy. JC agreed that it was mistaken; the vertical and horizontal tolerances were reversed in the specifications. JC stated that in the surveyor qualifications submittal, AT should provide a description of the proposed equipment and manufacturer's specification of tolerance for CHE review.
- o **RE** stated that the width of the breakwater is dimensioned at 42 ft, but the coordinates shown are slightly off from 42 ft by a few tenths of a foot. **JC** stated that this may be due to the slope; regardless, the controlling dimension is from the seaward toe of the structure, and the width will be controlled by the mattress size, which is 21 ft. Upon receipt of the preconstruction survey, **CHE** will re-locate the layout of the structure and will provide new coordinates to **AT** at that time.

#### ROCKEFELLER WILDLIFE REFUGE

5476 Grand Chenier Highway Grand Chenier, Louisiana 70643 Phone: 337-491-2593

## **Contractor Work Regulations**

Refuge property connects to Highway 82 in three sites i.e. Price Lake Road at the western boundary, Headquarters, and East Locks Road. Other land access is through neighboring properties which the Department has servitudes/agreements with landowners for routine refuge activities from Highway 82. Contractors seeking entrance are to contact these landowners:

## Joseph Harbor Boat Launch and Bulkhead

If access is needed to Joseph Harbor Boat Launch and Bulkhead they are to contact Mr. Richard Sturlese (337-278-0119 / 337-993-0962).

## Superior Canal Boat Launch

Access to the Superior Canal Boat Launch is to be obtained from Mr. Chad Courville, Land Manager for Miami Corporation (337-264-1695 / 337-344-4252). There is a locked gate and with Mr. Courville's permission the LDWF Rockefeller Refuge Program Manager can provide a key. Also, at this site boat access to the refuge is through Miami Corporation and Marilyn Miller Properties. Permission to cross the Miller Properties is to be obtained from Mr. J. C. Theriot (979-798-4699 / 979-299-2488).

## Rockefeller Management Unit 14 Area - Eastern Property Line Canal Area

Entrance to the Rockefeller Management Unit 14 area and Eastern Property Line Canal area is across private property managed by Mr. David Richard (337-433-1055 ext. 119). With Mr. Richard's permission the Rockefeller Refuge Program Manager will issue a key for passage.

## Rockefeller East Property Line Road

Road access along the Rockefeller East Property Line Road is through Mr. Martin Richard's property (504-887-2143) and with Mr. Richard's permission the program manager can provide access.

## Rollover Canal and eastern portion of the Refuge

A private Boat Launch at Pecan Island, Soustan's landing may be used to access Rollover Canal and the eastern portion of the Refuge.

## Gulf of Mexico - Intercoastal Canal

Boat access from the Gulf is through Rollover Canal and Joseph Harbor. Entrance from the Intracoastal Waterway is through Grand Lake and Superior Canal. Contact will need to be with Mr. Chad Courville (337-264-1695 / 337-344-4252) and J. C. Theriot (979-798-4699 / 979-299-2788) regarding the Superior Canal as it crosses Miami Corporation and Marilyn Miller Properties. LA DOTD (337-538-2551) needs to be contacted for passage through the Highway 82 swing bridge.

# Contractors are to comply with all rules and regulations of the Louisiana Department of Wildlife and Fisheries and Rockefeller Wildlife Refuge including the following:

- Normally work can begin at any time during the year and there are no Refuge closures that would stop work due to waterfowl migration onto the Refuge. Work could be delayed due to Parish closures caused by Tropical Storms or Hurricanes, or periodic refuge research or management activities. Contractors are to confirm with the Rockefeller Program Manager.
- The contractor must notify the Program Manager at least 7 days in advance of the project start date and schedule a meeting to discuss the project and Refuge Rules and Regulations.
- Work can normally be conducted on the Refuge 24 hours per day/seven days per week. There are no restrictions on work time for this project. Contractor must provide adequate safety measures to protect recreational boaters. Employees must have proper identification in possession while on the refuge and be prepared to display same as requested.
- Project work sites will be temporarily closed to the public to assure public safety if necessary.
- Equipment and supplies may be loaded from several landings on the Refuge. Boat access onto the Refuge and loading will be coordinated through the Program Manager.
- Large work boats and crew boats will be required to idle to and from job sites. The entire area is a NO WAKE ZONE. LDWF encourages the use of small boats to reduce levee erosion.
- Bringing firearms, bows and arrows, liquor and controlled dangerous substances (drugs) onto the Refuge is prohibited.
- Personnel are not permitted to fish, crab, shrimp, etc. while working on the project.
- All trash, debris, or hazardous materials generated during the project must be disposed offsite following all federal, state, and local regulations.
- The Program Manager is to be notified immediately of any accidents, injuries, spills, etc. (see attached emergency contact list).

## ROCKEFELLER WILDLIFE REFUGE EMERGENCY AND SUPPORT LISTINGS

Rockefeller Wildlife Refuge, 5476 Grand Chenier Highway, Grand Chenier, Louisiana 70643
Office Phone: 337-491-2593 Office Fax: 337-491-2595

Guthrie Perry, Program Manager	337-853-4077 Cell
The Mark Mark Mark Sandard	
Tom Hess, Biologist Manager	thoss@wiftle.gov
Brac Salyers, Biologist Supervisor	
mise pailets' piotogist pahet sigot	
Kim Bourriaque, Facilities Maintenance Manager	
Jubal Marceaux, Captain Region V, Enforcement Division	337-491-2588 Office
	337-577-3197 Cell
	<u>jmarceaux@wlf.la.go</u>
EMERGENCY	
Air Med	1-800-259-1234
Ambulance Service, Cameron	337-775-5111 or 911
Cameron Parish Volunteer Fire Department	337-775-5111 or 911
Cameron Parish Sheriff's Department	
Sheriff Theos Duhon	337-775-5714
P. O. Box 1250, Cameron, LA 70631	
SUPPORT	
Waste Management, Jake Philmon	337-436-7229
536 Wesley Road, Lake Charles, LA 70607	
Wilkerson Scrap	337-436-7146
P O Box 19037, Lake Charles, LA 70616	
Port-O-Let of LA LLC, Lauri Jones	504-394-8983
9486 Highway 23, Belle Chase, LA 70037	
Kentwood Water	337-494-7533
4810 E. Opelousas St., Lake Charles, LA 70615	225 555 5042
Cameron Parish Mosquito Control, Josh Hightower, Director 143 LeBlanc Road, Creole, LA 70632	337-775-5942
GROCERY/GENERAL MERCHANDISE/RESTAURANTS	
Kelley's Mart, LLC, 3261 Grand Chenier Hwy, Grand Chenier, LA 79	0643 337-538-2604
Booth's Grocery, 5657 Grand Chenier Hwy, Grand Chenier, LA 7064	
<b>G-Boy's Cajun Grill,</b> 4409 Creole Hwy, Creole, LA 70632	
CHURCHES	
Grand Chenier Methodist Church, Grand Chenier Highway, Grand (	Chenier I.A. 70643
Et Eugene Catholia Church 5025 Cread Chemica Here, Cread Chemi	

St. Eugene Catholic Church, 5035 Grand Chenier Hwy, Grand Chenier -----337-538-2245

## BioEngineered Oyster Reef Demonstration Project (LA-08)

File #: R28059DL, PO #: 3726092

Meeting Minutes, Progress Meeting

December 19, 2011, 10:00 am

#### **Attendees (see attached attendees list):**

**Coastal Protection and Restoration Authority (CPRA):** Darrell Pontiff (DP), Tye Fitzgerald (TF), Clayton Breland (CB)

Coast & Harbor Engineering (CHE): Josh Carter (JC), Casey Connor (CC)

**AquaTerra Contracting (AC):** Blake Dwoskin (BD)

#### **Start 10:00am**

JN discussed basic procedure of update meetings. CHE will put together an Agenda for future progress meetings. It should include:

- Contractor update on progress and schedule
- Discussion of submittals
- Discussion of RFI, ESI (as necessary)
- Discussion of change orders (as necessary)
- Discussion of payment
- Discussion of problems or delays
- CHE will put together meeting minutes and submit to team

## I. Contractor Progress Update

- AquaTerra has completed approximately 70% of the Normal Weight Concrete breakwater (35 marine mattresses and 271 armor units remain).
- 223 OysterKrete armor units are being remanufactured due to insufficient compressive strength testing. As of today the manufacturer has completed 168 of the 223 armor units (75% complete).
- CB asked why it was necessary for the OysterKrete armor units to be remanufactured.
- BD stated that it was due to insufficient compressive strength testing. The armor unit manufacturer chose to remake the units to maintain construction progress.
- JC added that the compressive strength testing results were not increasing over time as expected. Test results were approximately 10-20% lower than the required 3,000 psi. The manufacturer attempted to core several armor units; however, during the coring process the samples fractured and could not be tested. The manufacturer is in the process of altering the testing procedure to obtain a testing sample that better represents the armor unit manufacturing process. The manufacturer determined that the compressive strength testing results were insufficient for the following reasons:
  - o The OysterKrete design mix contains very little water and the slightest variation in moisture content can dramatically alter the strength.
  - o The cylinder molds were not prepared in a methodical, consistent process and did not represent the final product being manufactured.

- All of the Normal Weight Concrete armor units (621) and 220 of the OysterKrete armor units have been delivered to the stockpile site at Joseph's Harbor Bayou.
- JC stated that during the OysterKrete armor unit inspection at the manufacturing plant on 12/15/2011, 28 OysterKrete armor units were unaccounted for. 4 of the unaccounted for armor units were determined to have been used during armor unit coring which leaves 24 (one typical day's production) unaccounted for. CHE inspected the 220 armor units that have been delivered to the site and found that 11 of them were missing manufacturing labels. AquaTerra should conduct complete inventory to determine the location of all of the under-strength armor units.
- BD stated that they are expecting to be held up due to weather this week; however, they are hoping to complete the Normal Weight Concrete breakwater prior to breaking for the holidays.
- BD stated that they are on schedule and shouldn't have any problems completing construction on time as long as weather cooperates.
- JC asked what AquaTerra plans to do if they complete the Normal Weight Concrete breakwater this week as the OysterKrete armor units need to cure prior to installation.
- BD stated that they might have some downtime; however, they will likely complete other portions of the project such as installation of the navigation aids while they are waiting.

## II. Discussion of Submittals

- AquaTerra submitted the results of the first construction survey last week via email. CHE should receive hard copies soon. The second construction survey should be submitted later this week (assuming weather allows the placement of armor units this week).
- JC requested that AquaTerra submit the compressive strength test results of the remanufactured OysterKrete armor units as they become available.
- BD agreed.

## III. Discussion of RFI, ESI

• AquaTerra has received correspondence from the armor unit manufacturer regarding the new testing methodology. CHE should expect to receive within the next day or two.

## IV. Discussion of Change Orders

• N/A

## V. Discussion of Payment

- BD stated that they plan on submitting a payment voucher for work completed through December 2011.
- JC asked CPRA if they had a preferred form or template for payment vouchers.
- DP stated that they do not have a standard form; however, payment vouchers must include all necessary information for payment.
- BD stated that they have a standard form that they use and will submit it for review.

## VI. Discussion of Problems or Delays

- BD stated that the remanufacture of OysterKrete armor units was not expected to cause a significant delay. The largest potential for delay comes from sea state.
- BD asked about fog and if it's considered a weather day. So far they've had one day were fog was severe enough to shut down transporting the armor units from the Joseph's Harbor Bayou to the project site.
- JC requested AquaTerra submit sea state and fog documentation on their payment voucher as necessary for review.

## VII. Miscellaneous Items Discussed

- DP asked if the OysterKrete armor unit remanufacture will require another inspection as there were only 3 CHE inspections in the contract.
- JC stated that CHE would invoice AquaTerra directly for any armor unit inspection over the 3 that were included in the contract.
- DP asked when JC would be onsite next.
- JC stated that he would not likely be present for the remaining Normal Weight Concrete armor unit placement; however, he would like to be present for the first day of OysterKrete armor unit placement.
- BD stated that OysterKrete armor unit placement wouldn't likely start until mid-January 2012.

Meeting Concluded at 10:35 am.

The next Progress Meeting will be on January 3, 2012, at 10:00 am.

## BioEngineered Oyster Reef Demonstration Project (LA-08)

File #: R28059DL, PO #: 3726092

Meeting Minutes, Progress Meeting

January 3, 2012, 10:00 am

#### **Attendees (see attached attendees list):**

Coastal Protection and Restoration Authority (CPRA): Darrell Pontiff (DP), Tye Fitzgerald (TF), Clayton Breland (CB), Patrick Landry (PL)

Coast & Harbor Engineering (CHE): Josh Carter (JC), Casey Connor (CC)

**AquaTerra Contracting (AC):** Blake Dwoskin (BD)

#### **Start 10:00am**

## I. Contractor Progress Update

- Aquaterra has not done any onsite work since the previous meeting (12/19/2011) due to
  the holidays and poor weather. BD states that they are hoping to place 140 Normal
  Weight Concrete armor units today and the remaining marine mattresses necessary to
  complete the Normal Weight Concrete breakwater tomorrow. The Normal Weight
  Concrete breakwater is expected to be complete within the next few days.
- BD stated that all of the OysterKrete armor units have been remanufactured. They are waiting for test results prior to shipping to the stockpile site at Joseph's Harbor Bayou. BD stated that the last armor units were remanufactured on 12/20/2011.
- JC stated that he expected the last armor units to be remanufactured on 12/21/2011.
- BD stated that OldCastle didn't have to remanufacture as many as they previously thought due to the extra units they originally made.
- DP asked if the new OysterKrete armor unit testing data looked good.
- BD stated that the tests taken to date have showed adequate compressive strengths.
- DP asked about weather during December.
- BD stated that they have requested 9 weather days in their December pay application (an extra 5 weather days where waves and wind speeds resulted in adverse sea conditions). However, some of the days may have been prior to RFI 13 which stated that documentation must be provided.
- BD stated that an updated progress schedule has been provided in the December pay application which shows the end of construction on 2/28/2012, assuming 28 weather days. The original progress schedule showed the end of construction on 2/9/2012, assuming 32 weather days. The new end of construction date (2/28/2012) could be pushed to 3/5/2012 to be completely demobilized.
- JC asked about production rates and limiting factors.
- BD stated that prior to the holiday break they installed 180 units in 6.5 hours (approx. 28 units/hr) which is the capacity their barge can carry. The daily production is limited on how many armor units can be hauled at a time.
- JC asked about the schedule for installing the OysterKrete armor units.

- BD stated that the weather looks questionable this week. OysterKrete armor units might be able to be installed on Saturday, but it might be the following week depending on the weather.
- JC asked if the barges would stay onsite during the foul weather or pull back to the mouth of Joseph's Harbor Bayou.
- BD stated that they'd likely pull back to the loadout area and load OysterKrete armor units onto the barge before holding at the mouth of the bayou.
- DP asked JC if he would be onsite for the OysterKrete armor unit installation.
- JC stated that he would be in the area next week and hopes the schedule could work out.
- DP stated that several State of Louisiana personnel would like to be there as well and if he could be updated as necessary.
- JC stated that he would be in contact later this week.

## II. Discussion of Submittals

- CHE has not yet received hard copies of the first survey.
- JC asked about the second survey.
- BD stated that the surveyors haven't conducted a second survey, yet, but he's going to try to get the surveyors on site this week. The survey would be for ¾ of the contract length of the Normal Weight Concrete breakwater.

## III. Discussion of RFI, ESI

- AquaTerra submitted an RFI regarding the navigation aids locations this morning.
- JC stated that the navigation aid coordinates stated on the "For Construction" set of plans were updated when the alignment shifted as the result of the pre-construction survey. The navigation aids should be located 20 ft from the mattress extents of the base bid. However, CHE will formally respond.

## **IV.** Discussion of Change Orders

- DP stated that the State of Louisiana would need documentation of additional weather days requested for an official Change Order before the end of the project.
- JC asked if CHE needed to account for processing time.
- DP stated that CHE should account for a couple of weeks for processing.

## V. Discussion of Payment

• Aquaterra submitted a pay application for December this morning. CHE has not yet had time to review.

## VI. Discussion of Problems or Delays

- DP asked if the delivery of the OysterKrete armor units that needed to be remanufactured could delay construction.
- BD stated that it is possible for a delay if the weather is great for the month of January, but he doesn't expect it. If the weather cooperates and there are no failed compressive strength tests the project could be completed by 1/20/2012.

## VII. Miscellaneous Items Discussed

• N/A

Meeting Concluded at 10:30 am.

The next Progress Meeting will be on January 18, 2012, at 2:00 pm.

## BioEngineered Oyster Reef Demonstration Project (LA-08)

File #: R28059DL, PO #: 3726092

Meeting Minutes, Progress Meeting

January 20, 2012, 10:00 am

Attendees (see attached attendees list):

**Coastal Protection and Restoration Authority (CPRA):** Darrell Pontiff (DP), Tye Fitzgerald (TF)

Coast & Harbor Engineering (CHE): Josh Carter (JC), Casey Connor (CC)

**AquaTerra Contracting (AC):** Blake Dwoskin (BD)

#### **Start 10:00am**

## I. Contractor Progress Update

- AC finished the Normal Weight Concrete breakwater on 1/13/2012. No additional work has been performed due to weather.
- BD states that he is trying to pattern the weather to work when winds are from the south. Southern winds generate waves at the site large enough to limit construction. The work requires laborers to work in direct contact with the marine mattresses and armor units under water which poses a safety concern in heavy sea state conditions. In previous projects AC has had the laborers further from the actual construction work.
- DP stated that being concerned with safety is the correct approach.
- BD states that the final armor unit inspection was performed on 1/18/2012. OysterKrete armor units will begin shipping to the Joseph's Harbor stockpiling site on 1/23/2012. The navigation aids will be shipped to the Joseph's Harbor stockpiling site soon.
- CC added that one OysterKrete armor unit was rejected at the inspection due to exposed rebar and three units required patching. Oldcastle has manufactured approximately 10 each of the pegged and non-pegged OysterKrete armor units (20 total units) extra. To date all test reports for the remanufactured OysterKrete armor units have showed sufficient compressive strength tests. Remanufactured OysterKrete armor units can be shipped to Joseph's Harbor stockpiling site, but the 28 day compressive strength tests need to show sufficient strength before they can be installed.
- BD stated that Oldcastle made the additional approximately 20 OysterKrete armor units in the event that some may be rejected.
- JC added that Oldcastle has changed the entire manufacturing process of the OysterKrete armor units since insufficient strength test results. The armor units look better and more consistent.
- BD stated that since the change in manufacturing the triangular voids under the lift pin holes have gone away.
- BD stated that the OysterKrete breakwater could be completed with 8 working days.
- CC asked if AT would still be able to finish within the 210 days from NTP as stated in the contract.
- BD stated that based on production rates achieved during the Normal Weight Concrete breakwater there shouldn't be a problem getting done within the required timeframe.

- DP asked if AT was continuing to monitor the weather conditions.
- BD stated that they are now getting better documentation including site photos to show sea state at the project site.
- CC asked when the weather will allow construction to continue.
- BD stated that 1/24-1/26/2012 may work.
- CC stated that any info regarding when work will continue will be forwarded to CPRA.

## **II.** Discussion of Submittals

• CHE received the results of the second survey. The data was in the wrong coordinate system and had to be resubmitted. The resubmitted data has not been reviewed yet.

## III. Discussion of RFI, ESI

• N/A

## **IV.** Discussion of Change Orders

• AT will coordinate with CHE regarding billing for the additional armor unit inspection.

## V. Discussion of Payment

- BD asked about pay application submitted on 1/2/2012.
- DP stated that the pay application has been forwarded for processing.
- JC asked what the typical time for processing was.
- DP stated that processing takes approximately 1 month.

## VI. Discussion of Problems or Delays

• N/A

## VII. Miscellaneous Items Discussed

N/A

Meeting Concluded at 10:30 am.

The next Progress Meeting will be on January 30, 2012, at 10:00 am.

## BioEngineered Oyster Reef Demonstration Project (LA-08)

File #: R28059DL, PO #: 3726092

Meeting Minutes, Progress Meeting

January 30, 2012, 10:00 am

#### Attendees (see attached attendees list):

**Coastal Protection and Restoration Authority (CPRA):** Darrell Pontiff (DP), Tye Fitzgerald (TF)

Coast & Harbor Engineering (CHE): Josh Carter (JC), Casey Connor (CC)

AquaTerra Contracting (AC): Blake Dwoskin (BD)

National Oceanic and Atmospheric Administration (NOAA): Dr. John Foret: (JF)

#### **Start 10:00am**

## I. Contractor Progress Update

- AC has finished approximately 57% of the OysterKrete Breakwater A. As of this morning, 275 OysterKrete Armor Units and 90 marine mattresses have been placed.
- BD stated that there is a potential weather window between Thursday (2/2) and Monday (2/6) which should be enough time to complete the remainder of the project. Navigation aids will require 1-2 days for installation after the OysterKrete Armor Units are complete. The remaining OysterKrete Armor Units, marine mattresses and all navigation aid assemblies will be loaded onto the barges during the upcoming foul weather.

## II. Discussion of Submittals

• BD stated that surveyors are onsite today to survey the remaining Normal Weight Concrete Breakwater B and as much as they can for OysterKrete Breakwater A.

## III. Discussion of RFI, ESI

N/A

## IV. Discussion of Change Orders

N/A

## V. Discussion of Payment

• BD stated that AC will submit a pay application for January.

## VI. Discussion of Problems or Delays

• N/A

## VII. Miscellaneous Items Discussed

• JC stated that the final Armor Unit Inspection report should be finalized within the next few days.

- JC stated that DP might want to talk to Tommy Mansfield regarding the post-construction monitoring surveys as construction is nearly finished. AC surveyors will perform the Year-0 monitoring survey.
- DP stated that he will coordinate as necessary.
- JC asked if the CPRA wanted CHE to perform the Substantial Completion Inspection and prepare a punch list alone.
- DP stated that the CPRA wants to participate in both the Substantial and Final Completion Inspections.
- DP asked if the Substantial Completion Inspection would be ready by mid-February.
- BD stated that the Substantial Completion Inspection could be as early as the middle of next week.

Meeting Concluded at 10:15 am.

The next Progress Meeting will be on February 14, 2012, at 10:00 am.

## BioEngineered Oyster Reef Demonstration Project (LA-08)

File #: R28059DL, PO #: 3726092

Meeting Minutes, Progress Meeting

February 14, 2012, 10:00 am

#### **Attendees (see attached attendees list):**

**Coastal Protection and Restoration Authority (CPRA):** Darrell Pontiff (DP), Tye Fitzgerald (TF), Clayton Breland (CB), Patrick Landry (PL)

Coast & Harbor Engineering (CHE): Josh Carter (JC), Casey Connor (CC)

**AquaTerra Contracting (AC):** Blake Dwoskin (BD)

#### **Start 10:00am**

## I. Contractor Progress Update

- AC is currently cleaning up Joseph's Harbor Bayou stockpile site. All floating plant equipment has been demobilized.
- BD stated that a Rockefeller Refuge employee and LSU representative will be on-site today to place the extra 18 pegless armor units (10 OysterKrete and 8 Normal Weight Concrete). The extra units will be placed at the southwest corner of the airstrip along Joseph's Harbor Bayou. An email was forwarded to CHE to document approval from the Rockefeller Refuge for the extra ring placement.
- JC asked if the navigation aids have been completed including touch up paint.
- BD stated that work has been completed and the floating equipment has been demobilized.

## II. Discussion of Submittals

- BD stated that the final monitoring survey will be completed today. The survey for all installed items will be submitted today. Hard copies of surveys will be submitted soon.
- JC stated that several compressive strength test results were still outstanding. They were the 14 and 21 day test results for OysterKrete manufacture dates of 11/15, 11/16, and 11/17/2012.
- BD stated that the request has been forwarded to Oldcastle and Wayfarer.

## III. Discussion of RFI, ESI

N/A

## **IV.** Discussion of Change Orders

• DP stated that the change order for the incorrect geotextile should be submitted with the final pay application.

## V. Discussion of Payment

• BD stated that AC has received payment for December 2011, but payment for January 2012 has not yet been received.

• DP stated that AC can only request payment up to 95% of the contract amount (100% minus 5% retainage) in their final pay request. Three items must be submitted for the final payment: final pay request, change order documentation, and Notice of Acceptance from CHE.

## VI. Discussion of Problems or Delays

N/A

## VII. Miscellaneous Items Discussed

- JC asked if the armor unit cores that were delivered to the Joseph's Harbor Bayou stockpile site were still there. Tommy McGinnis (CPRA) was unable to use them and the Rockefeller Refuge likely won't want them to stay on-site.
- BD stated that they will be removed.
- BD asked if the final inspection will still be on Friday (2/17/2012).
- JC stated that he wanted to check the weather today before cancelling the originally scheduled final inspection on Wednesday (2/15/2012).
- DP stated that John Foret (NOAA) would be unable to attend on Friday; however, he did not mind missing the final inspection as he was present during the substantial completion inspection.
- DP stated that the Rockefeller Refuge can help out with boat transportation if necessary during the final inspection.
- BD stated that AC will have a boat with overhead cover, but can only have 6 passengers onboard (including boat captain).

Meeting Concluded at 10:15 am.



# LA-08 Bioengineered Oyster Reef Demonstration Project PO # 3726092, File #: R28059DL Armor Unit Acceptance Inspection Memorandum September 22, 2011

#### 1 Introduction

Coast & Harbor Engineering (CHE) visited the Oldcastle® concrete casting yard in Houston, TX on September 22, 2011, to conduct an acceptance inspection on the armor units fabricated for the LA-08 Bioengineered Oyster Reef Demonstration Project. CHE met with Michael Turley (Wayfarer Environmental Technologies), Blake Dwoskin (Aquaterra Contracting) and Asher Kazmann (Oldcastle Precast) during the inspection. This memorandum summarizes the findings of the inspection.

## 2 NORMAL WEIGHT CONCRETE ARMOR UNITS

CHE reviewed the Normal Weight Concrete Armor units, which generally appear acceptable and appear to be constructed in accordance with the construction plans and specifications. CHE observed the manufacturing process and it appears to be a professional and quality operation. No significant defects or indications of poor manufacture or fracturing were observed. Minor spalling was present, especially near the pegs and lift holes (Figure 1A). Oldcastle indicated that spalled areas can be repaired with mortar patches and showed examples of repair on units. The mortar patch repair appears acceptable. Several units' lift holes were nearly blocked by concrete, both on the inside and outside of the unit. The lift holes must be cleaned out and patched as necessary prior to shipment to ensure safe handling. Dark rings and/or mold release grease were seen around the lift holes (Figure 1B). This is only cosmetic and is not anticipated to have negative impact on the structural integrity of the units or performance of the structure.





Figure 1: A) Concrete spalling; B) Mold release grease around lift hole.

Horizontal delineation spanning the entire circumference were observed on some units (Figure 2). Oldcastle stated that this is caused during the initial pour when the concrete hopper does not have

the capacity to fill an entire mold. The few minutes it takes to fill the hopper combined with the natural color variation between concrete batches causes this delineation. This is only cosmetic and is not anticipated to have negative impact on the structural integrity of the units.



Figure 2: Horizontal delineation on the armor units.

Three armor units were deemed unacceptable and were rejected. On two of the units, rebar was exposed through the outside wall of the unit (Figure 3A). This is unacceptable, as exposure to sea water will lead to corrosion of the rebar and potential failure of the units. The third unit had a plastic wrapper embedded into the unit (Figure 3B). The plastic wrapper was thought to have been blown into the mold during Tropical Storm Lee.



Figure 3: A) Armor unit with exposed rebar; B) Armor unit with embedded plastic wrapper.

CHE needed additional time to inspect all of the units due to the stacking arrangement; a forklift was required to move units to provide access. The stacking arrangement should be modified to allow access around each unit for subsequent acceptance inspections.

## 3 OYSTERKRETE ARMOR UNITS

CHE was also able to inspect several OysterKrete armor units fabricated for a separate project to provide feedback prior to Wayfarer and Oldcastle manufacturing units for the LA-08 project. Wayfarer and Oldcastle stated that some smoothing of the outside surface of the armor units occurs as a result of vibrating the form. The vibration is required to ensure adequate consolidation of the oysterkrete, and reducing the vibration may result in a decrease in the strength of the unit. Voids below the lift holes were also observed (Figure 4), resulting from the dry nature of the oysterkrete material. Aquaterra stated that these could become problematic and a potential safety hazard during handling. Wayfarer and Oldcastle stated that this could be mitigated by vibrating under the lift holes using stingers during the initial concrete pour and by applying an epoxy to fill any remaining objectionable voids after curing. Wayfarer and Oldcastle indicated that these methods would be utilized and the appropriate methods put in place prior to production of units for the LA-08 project. These mitigation measures appear adequate to CHE and Aquaterra; however, the results will be reviewed during the next unit inspection.



Figure 4: Triangular voids under OysterKrete armor unit lift holes. Note that the unit is inverted.

#### 4 Conclusion

Normal weight concrete units were inspected for acceptance on September 22, 2011. Table 1 summarizes the design, inspected, rejected, and accepted quantities. Three pegged units were rejected due to exposed rebar and an embedded plastic wrapper. Accepted units were produced from 8/8/2011 through 9/20/2011. Units produced from 9/20 to 9/22 were not reviewed for acceptance and will be reviewed during the next inspection.

Table 1: Armor unit quantity summary.

Normal Weight Concrete	Design Inspected		Rejected	Accepted	
With Pegs	287	287	3	284	
Without Pegs	334	303	0	303	
Total	621	590	3	587	

The following measures should be implemented:

- Patch spalling as necessary;
- Remove lift hole blockages and patch as necessary;
- Ensure molds are free of any debris prior to pouring concrete;
- Stack armor units to allow easy inspection of every unit from all sides and group units by production date;
- Limit and/or filling voids under the OysterKrete armor unit lift holes;
- Number armor units such that each unit has a unique identification number; and
- Remove Oldcastle® and production information stickers from armor units prior to installation.



# LA-08 Bioengineered Oyster Reef Demonstration Project PO # 3726092, File #: R28059DL Armor Unit Acceptance Inspection #2 October 24, 2011

#### 1 Introduction

Coast & Harbor Engineering (CHE) visited the Oldcastle® concrete casting yard in Houston, TX on October 24, 2011, to conduct the second of three acceptance inspections on the oysterbreak armor units fabricated for the LA-08 Bioengineered Oyster Reef Demonstration Project. CHE met with Tyler Ortego (ORA Technologies, representing Wayfarer Environmental Technologies), Blake Dwoskin (Aquaterra Contracting), Michael Clausey (Oldcastle Precast), Darrell Pontiff and Tommy McGinnis (Coastal Protection and Restoration Authority) during the inspection. This memorandum summarizes the findings of the inspection.

#### 2 NORMAL WEIGHT CONCRETE ARMOR UNITS

CHE reviewed the remaining Normal Weight Concrete Armor Units, which generally appear acceptable and appear to be constructed in accordance with the construction plans and specifications.

## 3 OYSTERKRETE ARMOR UNITS

CHE reviewed the OysterKrete Armor Units, which generally appear acceptable and appear to be constructed in accordance with the construction plans and specifications. The following summarizes observations made by CHE:

- 1. Voids below the lift holes have been patched using mortar; however, Aquaterra believed that the patches were insufficient and should be corrected (Figure 1A).
- 2. Several units (notably #42 and #170) had clumps of fibers exposed along the face of the unit (Figure 1B). Oldcastle believed the clumps were caused during the mixing process due to how the fibers were placed into the mixing hopper. Mixing procedures would be altered to minimize future clumping. Clumped fibers must be removed and patched with mortar as necessary.
- 3. Some smoothing was noted on the outsides of some of the armor units caused by vibrating the form. One unit (#24) was rejected due to smoothing exceeding specifications (Figure 2).
- 4. Several armor units had surface deformations that needed to be patched (notably #20, 54, 59, 226, and 297; others may require patching as well).

- 5. The armor stacking arrangement to allow access for inspection was improved. However, units with various manufacturing dates, concrete mix, and identification number were mixed together making efficient inspection difficult
- 6. Several armor oysterkrete units did not have a unique identification number.



Figure 1: A) Oysterkrete Unit void patching; B) Oysterkrete Unit exposed fiber clump.



Figure 2: Oysterkrete Unit rejected (#24) due to excessive smoothing.

#### 4 Conclusion

Normal Weight Concrete and OysterKrete Armor Units were inspected for acceptance on October 24, 2011. Table 1 summarizes the design, inspected, rejected, and accepted quantities. One non-pegged OysterKrete Armor Unit was rejected due to excessive surface smoothing. Accepted units were produced from 9/19/2011 through 9/23/2011 (Normal Weight Concrete) and 9/23/2011 through 10/21/2011 (OysterKrete). Units produced from 10/22 to 10/24 were not reviewed for acceptance and will be reviewed during the next (final) inspection.

Table 1: Armor unit quantity summary.

Normal Weight		Unit Inspection #1			Unit Inspection #2			Totals
Concrete	Design	Inspected	Rejected	Accepted	Inspected	Rejected	Accepted	Accepted
With Pegs	287	287	3	284	3	0	3	287
Without Pegs	334	303	0	303	31	0	31	334
Total	621	590	3	587	34	0	34	621
OysterKrete	Design	Inspected	Rejected	Accepted	Inspected	Rejected	Accepted	
With Pegs	287	0	0	0	0	0	0	0
Without Pegs	334	0	0	0	316	1	315	315
Total	621	0	0	0	316	1	315	315
Armor Units	Design	Inspected	Rejected	Accepted	Design	Inspected	Rejected	
Total	1242	590	3	587	350	1	315	936

The following measures are to be implemented:

- Remove and repatch void areas under lift holes in OysterKrete units so at least 3 inches of mortar is inserted into each side of the void;
- Remove fiber clumps and patch as necessary;
- Patch spalling/surface deformations as necessary;
- Stack armor units to allow easy inspection of every unit from all sides and group units by production date;
- Remove Oldcastle® and production information stickers from armor units after shipping and prior to installation.



# LA-08 Bioengineered Oyster Reef Demonstration Project PO # 3726092, File #: R28059DL Armor Unit Acceptance Inspection #3 December 15, 2011

#### 1 Introduction

Coast & Harbor Engineering (CHE) visited the Oldcastle® concrete casting yard in Houston, TX on December 15, 2011, to conduct the third of three acceptance inspections on the oysterbreak armor units fabricated for the LA-08 Bioengineered Oyster Reef Demonstration Project. CHE met with Mike Turley (Wayfarer Environmental Technologies), Blake Dwoskin (Aquaterra Contracting), and Michael Clausey (Oldcastle Precast) during the inspection. This memorandum summarizes the findings of the inspection.

## 2 OYSTERKRETE ARMOR UNITS - REVISION OF UNIT INSPECTION #2

Upon receipt of compressive strength test results on 11/23/2011 which summarized results of tests completed up to 11/23, and per general correspondence #2 received on 12/8/2011, WET determined that a total of 225 OysterKrete Armor Units did not meet the specified required compressive strength and has elected to re-cast those units. The units to be re-cast include units #229-276 (48 units cast 10/12 to 10/17/2011); #277-316 (40 units cast on 10/18 to 10/20/2011); #317-328 (12 units cast on 10/21/2011); #401-436 (36 units cast on 10/27 to 10/28/2011); #533-621 (89 units cast from 11/4 to 11/10/2011). During the Armor Unit Inspection #2 conducted 10/24/2011, CHE reviewed 316 OysterKrete Armor Units and rejected one due to an excessively smooth surface. The approval of these units was pending compressive strength test results that meet the specifications. Therefore, units produced from 10/12 though 10/21 that were reviewed have been rejected, and the number of accepted units has been modified for the Unit Inspection #2, as reflected in Table 2. All rejected units were marked with orange spray paint as shown in Figure 1.



Figure 1. Rejected OysterKrete armor units marked with orange spray paint.

#### 3 OYSTERKRETE ARMOR UNITS

During Unit Inspection #3, CHE reviewed a total of 166 OysterKrete Armor Units (140 pegged, 26 non-pegged), which appear acceptable and appear to be constructed in accordance with the construction plans and specifications. Compressive strength test results have been received for these 166 OysterKrete Armor Units; all meet or exceed the required minimum strength. These units are numbered #213, 214, 225, 226, 333-400, and 437-532 (note that two units of these 168 were not located and therefore only 166 were reviewed). None of the 166 units reviewed were rejected.

The following summarizes observations made by CHE:

- 1. Voids below the lift holes identified during Unit Inspection #2 appear to have been reduced. No major problems with lift hole voids were observed.
- 2. Some smoothing was noted on the outsides of three of the armor units caused by overvibrating the form (units #394, 442, 473). However, smoothing did not exceed maximum allowed by specifications and therefore were accepted.
- 3. Two armor units had surface deformations that needed to be patched (units #508 and 343; others may require patching as well).
- 4. Several units did not have PVC liners at lift holes (units #344, 349, and possibly others). PVC is not a designed item and was included for ease of forming by Oldcastle. There is no problem from a design viewpoint without PVC liners. However, Aquaterra expressed concern that without PVC liners, the lift hole opening diameter may differ which may cause difficulty in the handling operations.

#### 4 BACKUP NORMAL WEIGHT CONCRETE ARMOR UNITS

CHE reviewed 31 extra Normal Weight Concrete (NWC) Armor Units. WET stated that these units were produced as backups to the 621 NWC Armor Units. These 31 backup NWC Armor Units appear acceptable and appear to be constructed in accordance with the construction plans and specifications. A total of 31 NWC Armor Units were reviewed, including 14 units with pegs and 17 without pegs. Table 1 summarizes the dates and number of units reviewed as well as the status of compressive strength testing results. Units where test results have not been received (indicated as "Not Received" in Table 1) are not to be used in construction until test results are reviewed by CHE.

Table 1: Backup NWC unit quantity summary.

Date Produced	Number Reviewed	peg /no peg	Compressive Test
8/10/2011	2	peg	pass
8/26/2011	2	peg	Pass
8/31/2011	2	peg	Pass
9/6/2011	4	no peg	Pass
9/7/2011	2	no peg	Pass
9/8/2011	2	no peg	Pass
9/9/2011	2	no peg	Pass
9/19/2011	2	no peg	Not Received
9/20/2011	3	no peg	Pass
9/21/2011	2	no peg	Pass
11/28/2011	2	peg	Not Received
11/29/2011	2	peg	Not Received
11/30/2011	2	peg	Not Received
12/1/2011	2	peg	Not Received

## 5 BACKUP OYSTERKRETE ARMOR UNITS

CHE reviewed 76 extra OysterKrete Armor Units, all with pegs. WET stated that these units were produced as backups to the 621 OysterKrete Armor Units, and were produced prior to identifying the low compressive strength issues. These 76 backup OysterKrete Armor Units appear acceptable and appear to be constructed in accordance with the construction plans and specifications. Compressive strength test results have not been received for any of these extra units, and therefore are not to be used in construction until test results are reviewed by CHE. The extra units are numbered #618, 620-699.

#### 6 CONCLUSION

OysterKrete Armor units and backup OysterKrete and Normal Weight Concrete Armor Units were inspected for acceptance on December 15, 2011. Table 2 summarizes the design, inspected, rejected, and accepted quantities. Note that quantities in Unit Inspection #2 were modified based on failure of several units in compressive strength.

Table 2: Armor unit quantity summary (Note: I = Inspected, R = Rejected; A = Accepted).

				<del></del>		_					<u> </u>
Normal Weigh	nt	Unit Insp. #1			Uni	Unit Insp. #2			t Insp	. #3	Totals
Concrete	Design	I	R	Α	I	R	Α	I	R	Α	Accepted
With Pegs	287	287	3	284	3	0	3	0	0	0	287
Without Pegs	334	303	0	303	31	0	31	0	0	0	334
Total	621	590	3	587	34	0	34	0	0	0	621
			_	_		_			_		
OysterKrete	Design		R	Α	l	R	Α	ı	R	Α	
With Pegs	287	0	0	0	0	0	0	140	0	140	140
Without Pegs	334	0	0	0	316	96	220	26	0	26	246
Total	621	0	0	0	316	96	220	166	0	166	386
Armor Units	Design		R	Α	ı	R	Α	ı	R	Α	
Total	1242	590	3	587	350	1	254	166	0	166	1007

Table 3: Backup Armor unit quantity summary (Note: I = Inspected, R = Rejected; A = Accepted).

	P							, , , ,		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	7. 7.000p.
Normal Weigh	nt	Un	Unit Insp. #1			Unit Insp. #2			t Insp	Totals	
Concrete	Design	I	R	Α	- 1	R	Α	1	R	Α	Accepted
With Pegs		0	0	0	0	0	0	14	0	14	14
Without Pegs		0	0	0	0	0	0	17	0	17	17
Total		0	0	0	0	0	0	31	0	31	31
OysterKrete	Design	ı	R	Α	ı	R	Α	1	R	Α	
With Pegs		0	0	0	0	0	0	76	0	76	76
Without Pegs		0	0	0	0	0	0	0	0	0	0
Total		0	0	0	0	0	0	76	0	76	76
Armor Units	Design	1	R	Α	ı	R	Α	- 1	R	Α	
Total		0	0	0	0	0	0	107	0	107	107

The following measures are to be implemented and/or continued:

- Remove fiber clumps and patch as necessary;
- Patch spalling/surface deformations as necessary;
- Stack armor units to allow easy inspection of every unit from all sides and group units by production date.



# LA-08 Bioengineered Oyster Reef Demonstration Project PO # 3726092, File #: R28059DL Armor Unit Acceptance Inspection #4 January 18, 2012

#### 1 Introduction

Coast & Harbor Engineering (CHE) visited the Oldcastle® concrete casting yard in Houston, TX on January 18, 2012, to conduct the fourth and final acceptance inspection on the Oysterbreak Armor Units fabricated for the LA-08 Bioengineered Oyster Reef Demonstration Project. CHE met with Mike Turley and Tyler Ortego (Wayfarer Environmental Technologies), Blake Dwoskin (Aquaterra Contracting), and Michael Clausey (Oldcastle Precast) during the inspection. This memorandum summarizes the findings of the inspection.

#### 2 OYSTERKRETE ARMOR UNITS

During Unit Inspection #4, CHE reviewed a total of 184 OysterKrete Armor Units (85 pegged, 99 non-pegged). Two were rejected, leaving a total of 182 units (83 pegged, 99 non-pegged), which appear acceptable and appear to be constructed in accordance with the construction plans and specifications. Compressive strength test results have been received for these OysterKrete Armor Units; all meet or exceed the required minimum strength. These units are numbered R1 through R185 (note that unit R150 and R151 were not located, and two units were numbered R172; therefore 184 were reviewed).

The following summarizes observations made by CHE:

- 1. Two units were rejected. One was rejected as it was not labeled and could not be positively identified and correlated with testing results. The second unit, #R97, was rejected as rebar was exposed through the OysterKrete on one wall.
- 2. Voids below the lift holes identified during Unit Inspection #2 appear to have been reduced. No major problems with lift hole voids were observed.
- 3. Some smoothing was noted on the outsides of one of the armor units caused by overvibrating the form (unit #R165). However, smoothing did not exceed maximum allowed by specifications and therefore was accepted.
- 4. Three armor units had surface deformations that needed to be patched (units #R135, R152 R92). Others may require patching as well.

#### 3 CONCLUSION

OysterKrete Armor Units were inspected for acceptance on January 18, 2012. Table 1 summarizes the design, inspected, rejected, and accepted quantities and Table 2 summarizes the backup armor

unit quantities. A sufficient quantity of acceptable pegged and non-pegged Normal Weight and Oysterkrete Armor Units have been manufactured to construct the project when both regular and backup units are counted.

Table 1: Armor unit quantity summary (Note: I = Inspected, R = Rejected; A = Accepted).

					•						,			
Normal Weig	ht	In	sp.	#1	Ir	nsp. #	‡2	In	sp. i	#3	In	sp. #	<del>4</del> 4	Totals
Concrete	Design	I	R	Α	I	R	Α	1	R	Α	I	R	Α	Accepted
With Pegs	287	287	3	284	3	0	3	0	0	0	0	0	0	287
No Pegs	334	303	0	303	31	0	31	0	0	0	0	0	0	334
Total	621	590	3	587	34	0	34	0	0	0	0	0	0	621
OysterKrete	Design	I	R	Α	I	R	Α	I	R	Α	I	R	Α	
With Pegs	287	0	0	0	0	0	0	140	0	140	85	2	83	223
No Pegs	334	0	0	0	316	96	220	26	0	26	99	0	99	345
Total	621	0	0	0	316	96	220	166	0	166	184	2	182	568
Armor Units	Design	I	R	А	I	R	А	I	R	Α	I	R	Α	
Total	1242	590	3	587	350	1	254	166	0	166	184	2	182	1189

Table 2: Backup Armor unit quantity summary (Note: I = Inspected, R = Rejected; A = Accepted).

Normal Weig	ht	Ir	isp. #	<del>/</del> 1	I	nsp. #	2	ln	sp. #	<b>#</b> 3	Ir	nsp. #	4	Totals
Concrete	Design		R	Α	I	R	Α	- 1	R	Α	- 1	R	Α	Accepted
With Pegs		0	0	0	0	0	0	14	0	14	0	0	0	14
No Pegs		0	0	0	0	0	0	17	0	17	0	0	0	17
Total		0	0	0	0	0	0	31	0	31	0	0	0	31
OysterKrete	Design	Ι	R	Α	-	R	Α	I	R	Α	I	R	Α	
With Pegs		0	0	0	0	0	0	76	0	76	0	0	0	76
No Pegs		0	0	0	0	0	0	0	0	0	0	0	0	0
Total		0	0	0	0	0	0	76	0	76	0	0	0	76
Armor Units	Design	Ι	R	Α	I	R	Α	I	R	А	I	R	Α	
Total		0	0	0	0	0	0	107	0	107	0	0	0	107

Table 3: Total armor unit quantity summary (Note: I = Inspected, R = Rejected; A = Accepted).

Normal Weig	ht	ln	sp.	#1	Ir	nsp. #	<b>‡2</b>	In	sp. i	#3	In	sp. #	<del>7</del> 4	Totals
Concrete	Design	- 1	R	Α	I	R	Α	- 1	R	Α	I	R	Α	Accepted
With Pegs	287	287	3	284	3	0	3	14	0	14	0	0	0	301
No Pegs	334	303	0	303	31	0	31	17	0	17	0	0	0	351
Total	621	590	3	587	34	0	34	31	0	31	0	0	0	652
OysterKrete	Design	I	R	Α	I	R	Α	I	R	Α	I	R	Α	
With Pegs	287	0	0	0	0	0	0	216	0	216	85	2	83	299
No Pegs	334	0	0	0	316	96	220	26	0	26	99	0	99	345
Total	621	0	0	0	316	96	220	242	0	242	184	2	182	644
Armor Units	Design	I	R	Α	I	R	Α	_	R	Α	I	R	Α	
Total	1242	590	3	587	350	96	254	273	0	273	184	2	182	1296



Project Name: BioEngineered Oyster Reef Demonstration (LA-08) File #: R28059DL, PO#: 3726092	<b>Date</b> : 10/19/2011
Location: Harvey, LA	Contract No.: 2503-12-16 CHE Project No: 0843.C
Type of Work: Oysterbreak Breakwater Construction	Work Order: Task #4
Contractor's Representative(s) and Title: Project Superintendent - David Wisema	nn
Working Days: M T W T F S S	
Weather: Clear Rain Mist Hot Cold Warm Foggy Temper	rature Range:50-75
Site Condition: Calm Windy Waves>3ft Winds: 15-20 mph winds fr	rom NW
Personnel and Equipment on Site:	
Equipment:  Loader, John Deere 644H  Excavator, Komatsu PC 400 LC  Personnel  Superintendent – D  Laborers (5)	avid Wiseman
Contractor: Aquaterra Contracting, LLC	
Subcontractor(s): n/a	
Work Day: Yes No No	
Work Conducted:  ☐ Marine Mattress Assembly ☐ Marine Mattress Install ☐ Conducted: ☐ Excavation ☐ Miscellaneous Metals ☐ Dredging (Access Characteristics)	•
Completed to date:  43 mattresses assembled as of 10/18/11, 3 produced up to time of site visit (1)	10-1130am) on 10/19/11.

## **Discussions with Contractor and Outstanding Issues:**

- Aquaterra stated that they are producing now on average 11 units per day. Initially was less, but now at a steady pace.
- CHE discussed stockpiling the marine mattresses with Aquaterra; mattresses are to be placed on a ground cover and be covered while stockpiled. One of the covers had blown off overnight due to high winds of cold front passage. The covers should be checked each morning and evening to ensure they remain in place and cover the units.



Figure 1. Completed Marine Mattresses.



Figure 2. Stockpiled marine mattresses covered with plastic.



Figure 3. Marine Mattress filling frame.





Figure 5. Marine Mattress, geogrid, and geotextile fabric assembly.

# Problems/Issues Identified and resolved:

■ N/A

Josh Carter



Project Name: BioEngineered Oyster Reef Demonstration (LA-08) File #: R28059DL, PO#: 3726092	<b>Date</b> : 12/6/2011
Location: Rockefeller Wildlife Refuge	<b>Contract No.:</b> 2503-12-16 <b>CHE Project No:</b> 0843.C
Type of Work: Oysterbreak Breakwater Construction	Work Order: Task #4
Contractor's Representative(s) and Title: David Wiseman – Project Superintende Project Superintendent	ent; Thomas Gruber –
Working Days: M M T W T F S S	
<b>Weather:</b> □Clear □Rain □Mist □Hot □Cold □Warm □Foggy Tempe	rature Range:45-50
Site Condition: Calm Windy Waves 1-3ft Winds: 10-15 mph winds	from N
Personnel and Equipment on Site:	
Equipment:  Crane, Terex 9310A Excavator, Komatsu PC 400 LC Forklift, JLG G10-55A Tugboat Deck Barges (2) Crew Boats (2)	
Contractor: Aquaterra Contracting, LLC	
Subcontractor(s): n/a	
Work Day: Yes No No	
Work Conducted:  Marine Mattress Assembly  Marine Mattress Install  Surveying  Excavation  Miscellaneous Metals  Dredging (Access Char	·
<ul> <li>No work was done today as the crane to hoist the armor units and marine marepairs; however, it was repaired at approximately 9:00 pm.</li> <li>The following is a summary table of the armor unit status to date:</li> </ul>	attresses was down for

Normal Weight Concrete	Design	<b>Inspected at Site</b>	Rejected at Site	Installed
with pegs	287	280	0	0
without pegs	334	334	0	0
Total	621	614	0	0
OysterKrete	Design	<b>Inspected at Site</b>	Rejected at Site	Installed
with pegs	287	0	0	0
without pegs	334	220	0	0
Total	621	220	0	0
Total	1,242	834	0	0
Marine Mattresses Mattresses	<b>Design</b> 172	Inspected at Site	Rejected at Site	Installed
1114111 05505	1/2	1/7	0	J

## **Completed to date:**

- 614 Normal Weight Concrete and 220 OysterKrete armor units have been delivered to the site.
- 174 marine mattresses have been delivered to the site.

#### **Discussions with Contractor and Outstanding Issues:**

- CHE discussed stockpiling the marine mattresses with Aquaterra: Mattresses are to be placed on a ground cover and be covered while stockpiled on land and on the barge. Several covers had blown off overnight due to high winds. The covers should be checked each morning and evening to ensure they remain in place and cover the units.
- CHE discussed armor unit orientation and placement while on the barge: Specifications on unit handling state pegged units shall be placed with the pegs up to ensure no stress occurs on the pegs. If damage is caused to units due to improper handling, contractor will be responsible for replacing damaged units. Also, all armor units shall have a rubber spacer between the barge deck and the armor units and be secured with proper dunnage during transport. Any armor units damaged prior to installation will not be accepted.
- CHE reviewed all of the armor units delivered to the site. A pegged Normal Weight Concrete armor unit was found to be chipped at the bottom of one of the pegs by approximately 3 inches (see Figure 1). Rebar does not appear to be exposed, however, it is unknown if the rebar has the required 1.5 inches minimum concrete coverage. If AquaTerra is unable to patch the affected area the unit shall be replaced with a satisfactory unit. Several stockpiled armor units have Styrofoam adhered to the top of the units (see Figure 2). The Styrofoam shall be removed prior to installation. One pegless OysterKrete armor unit was found to have a piece of plywood embedded into the interior side of the unit, see Figure 3. The wood shall be removed and the void patched as necessary.



Figure 1: Chipped peg of a Normal Weight Concrete armor unit.



Figure 2: Styrofoam adhered to the top of an armor unit.



Figure 3: Plywood embedded into OysterKrete armor unit.

## Problems/Issues Identified and Resolved:

N/A

Casey L. Connor, P.E.

GLA



Project Name: BioEngineered Oyster Reef Demonstration (LA-08) File #: R28059DL, PO#: 3726092	<b>Date</b> : 12/7/2011
Location: Rockefeller Wildlife Refuge	Contract No.: 2503-12-16 CHE Project No: 0843.C
Type of Work: Oysterbreak Breakwater Construction	Work Order: Task #4
Contractor's Representative(s) and Title: Blake Dwoskin – Project Manager; Da Superintendent; Thomas Gruber – Project Superintendent	avid Wiseman – Project
Working Days: M T X W T F S S	
Weather: Clear Rain Mist Hot Cold Warm Foggy Temper	erature Range:40-50
Site Condition: Calm Windy Waves 1-3ft Winds: 10-15 mph winds	s from NE
Personnel and Equipment on Site:	
Equipment:  Crane, Terex 9310A  Excavator, Komatsu PC 400 LC  Forklift, JLG G10-55A  Tugboat  Deck Barges (2)  Crew Boats (2)	
Contractor: Aquaterra Contracting, LLC	
Subcontractor(s): n/a	
Work Day: Yes No No	
Work Conducted:  Marine Mattress Assembly  Marine Mattress Install  Surveying  Excavation  Miscellaneous Metals  Dredging (Access Cha	
<ul> <li>Both barges were moved from their loading location along the Joseph's Har area. No installation work was done today.</li> <li>The following is a summary table of the armor units to date:</li> </ul>	bor Bayou to the placement

Normal Weight Concrete	Design	<b>Inspected at Site</b>	Rejected at Site	Installed
with pegs	287	280	0	0
without pegs	334	334	0	0
Total	621	614	0	0
OysterKrete	Design	Inspected at Site	Rejected at Site	Installed
with pegs	287	0	0	0
without pegs	334	220	0	0
Total	621	220	0	0
Total	1,242	834	0	0

## **Completed to date:**

• 614 Normal Weight Concrete and 220 OysterKrete armor units have been delivered to the site.

## **Discussions with Contractor and Outstanding Issues:**

■ N/A

## Problems/Issues Identified and Resolved:

■ N/A

Casey L. Connor, P.E.

Cyl Cu



Project Name: BioEngineered Oyster Reef Demonstration (LA-08) File #: R28059DL, PO#: 3726092	<b>Date</b> : 12/8/2011
Location: Rockefeller Wildlife Refuge	<b>Contract No.:</b> 2503-12-16 <b>CHE Project No:</b> 0843.C
Type of Work: Oysterbreak Breakwater Construction	Work Order: Task #4
Contractor's Representative(s) and Title: Blake Dwoskin – Project Manager; Dav Superintendent; Thomas Gruber – Project Superintendent	vid Wiseman – Project
Working Days: M T W X T F S S	
Weather: Clear Rain Mist Hot Cold Warm Foggy Tempe	rature Range:35-50
Site Condition: Calm Windy Waves 0-1ft Winds: 5-10 mph winds f	rom E
Personnel and Equipment on Site:	
Equipment:  Crane, American 9310A  Excavator, Komatsu PC 400 LC  Forklift, JLG G10-55A  Tugboat  Deck Barges (2)  Crew Boats (2)	
Contractor: Aquaterra Contracting, LLC	
Subcontractor(s): n/a	
Work Day: Yes No No	
Work Conducted: ☐ Marine Mattress Assembly ☐ Marine Mattress Install ☐ G ☐ Surveying ☐ Excavation ☐ Miscellaneous Metals ☐ Dredging (Access Char	Oysterbreak Install nnel)  Pile Driving
<ul> <li>26 marine mattresses were installed today (see Figure 1 and Figure 2). Norm units will begin installation tomorrow morning.</li> </ul>	al Weight Concrete armor

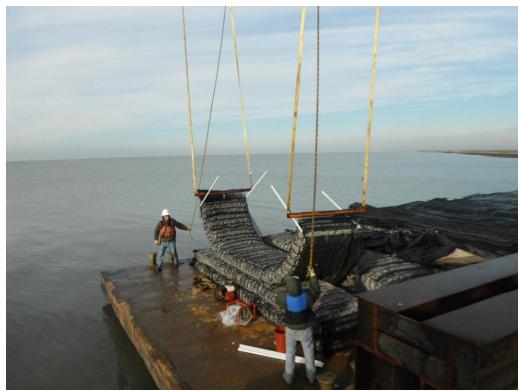


Figure 1: Hoisting of marine mattress.



Figure 2: Installation of marine mattress.

• The following is a summary table of the installation to date:

Normal Weight Concrete	Design	Inspected at Site	Rejected at Site	Installed
with pegs	287	280	0	0
without pegs	334	334	0	0
Total	621	614	0	0
OysterKrete	Design	Inspected at Site	Rejected at Site	Installed
with pegs	287	0	0	0
without pegs	334	220	0	0
Total	621	220	0	0
Total	1,242	834	0	0
<b>Marine Mattresses</b>	Design	Inspected at Site	Rejected at Site	Installed
Mattresses	172	174	0	26

## **Completed to date:**

- 614 Normal Weight Concrete and 220 OysterKrete armor units have been delivered to the site.
- 174 marine mattresses have been delivered to the site; 26 have been installed.

## **Discussions with Contractor and Outstanding Issues:**

- CHE discussed marine mattress placement: Marine mattresses shall be installed no more than 3 inches between mattresses in the cross-shore direction, and no spacing between units in the longshore direction.
- CHE discussed marine mattress surveying: Marine mattresses shall be surveyed during the armor unit survey. The survey rod will be placed through both set of units to contact the marine mattress.

#### Problems/Issues Identified and Resolved:

N/A

Casey L. Connor, P.E.



Project Name: BioEngineered Oyster Reef Demonstration (LA-08) File #: R28059DL, PO#: 3726092	<b>Date</b> : 12/9/2011	
Location: Rockefeller Wildlife Refuge	Contract No.: 2503-12-16 CHE Project No: 0843.C	
Type of Work: Oysterbreak Breakwater Construction	Work Order: Task #4	
Contractor's Representative(s) and Title: Blake Dwoskin – Project Manager; Da Superintendent; Thomas Gruber – Project Superintendent	vid Wiseman – Project	
Working Days: M T W T S S		
Weather: Clear Rain Mist Hot Cold Warm Foggy Tempe	rature Range:40-50	
Site Condition: Calm Windy Waves 0-1ft Winds: 5-10 mph winds f	rom E	
Personnel and Equipment on Site:		
Equipment:  Crane, American 9310A  Excavator, Komatsu PC 400 LC  Forklift, JLG G10-55A  Tugboat  Deck Barges (2)  Crew Boats (2)		
Contractor: Aquaterra Contracting, LLC		
Subcontractor(s): n/a		
Work Day: Yes ⊠ No □		
Work Conducted:  Marine Mattress Assembly  Marine Mattress Install  Surveying  Excavation  Miscellaneous Metals  Dredging (Access Char		
■ 128 Normal Weight Concrete armor units (54 with pegs; 74 without pegs) w Figure 1 and Figure 2). At the end of the day it was determined that AquaTe units with pegs (top row) backwards (rotated 180 deg) and would need to be	rra placed all of today's	



Figure 1: Positioning Normal Weight Concrete armor units (without pegs).



Figure 2: Today's progress of Normal Weight Concrete armor unit installation.

• The following is a summary table of the installation to date:

Normal Weight Concrete	Design	<b>Inspected at Site</b>	Rejected at Site	<b>Installed</b>
with pegs	287	280	0	54
without pegs	334	334	0	74
Total	621	614	0	128
OysterKrete	Design	Inspected at Site	Rejected at Site	Installed
with pegs	287	0	0	0
without pegs	334	220	0	0
Total	621	220	0	0
Total	1,242	834	0	0
Marine Mattresses Mattresses	Design 172	Inspected at Site	Rejected at Site	Installed 26
wiatticsses	1/2	1/4	U	20

## **Completed to date:**

- 614 Normal Weight Concrete and 220 OysterKrete armor units have been delivered to the site.
- 128 Normal Weight Concrete armor units have been installed.
- 174 marine mattresses have been delivered to the site; 26 have been installed.

#### **Discussions with Contractor and Outstanding Issues:**

• CHE discussed marine mattress placement: One marine mattress placed yesterday was installed such that one side of the mattress was on top of the adjacent mattress (see Figure 3). AquaTerra corrected prior to armor unit placement.



Figure 3: Marine mattress installed on top of adjacent mattress.

• CHE discussed armor unit placement. One section of armor units had a visible hump due to improper armor unit placement or existing bathymetric conditions.

## Problems/Issues Identified and Resolved:

■ N/A

Casey L. Connor, P.E.

G/ Cu



<b>Date</b> : 12/17/2011	
Contract No.: 2503-12-16 CHE Project No: 0843.C	
Work Order: Task #4	
ent; Thomas Gruber –	
rature Range:50-60	
from N	
Oysterbreak Install nnel)  Pile Driving	
ere installed today (see	

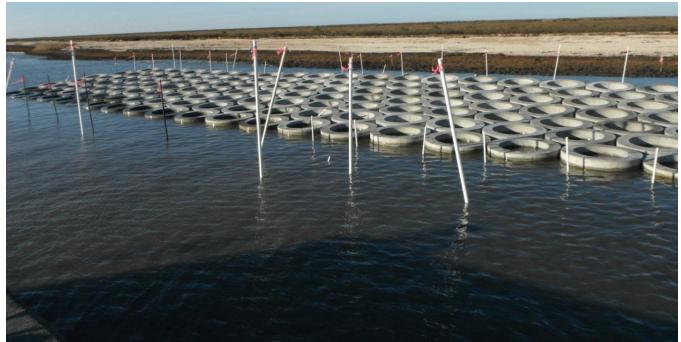


Figure 1: Today's progress of Normal Weight Concrete armor unit installation.

• The following is a summary table of the installation to date:

Normal Weight Concrete	Design	<b>Inspected at Site</b>	Rejected at Site	Installed
with pegs	287	280	0	161
without pegs	334	334	0	189
Total	621	614	0	350
OysterKrete	Design	<b>Inspected at Site</b>	Rejected at Site	Installed
with pegs	287	0	0	0
without pegs	334	220	0	0
Total	621	220	0	0
Total	1,242	834	0	350
Marine Mattresses Mattresses	<b>Design</b> 172	Inspected at Site 174	Rejected at Site	Installed 52

## **Completed to date:**

- 614 Normal Weight Concrete and 220 OysterKrete armor units have been delivered to the site.
- 350 Normal Weight Concrete armor units have been installed.
- 174 marine mattresses have been delivered to the site; 52 have been installed.

## **Discussions with Contractor and Outstanding Issues:**

• CHE discussed armor unit placement. The armor units shall be placed such that each unit is in direct contact with adjacent armor units.

## Problems/Issues Identified and Resolved:

■ N/A

Casey L. Connor, P.E.

G/M



Project Name: BioEngineered Oyster Reef Demonstration (LA-08) File #: R28059DL, PO#: 3726092	<b>Date</b> : 12/18/2011
Location: Rockefeller Wildlife Refuge	<b>Contract No.:</b> 2503-12-16 <b>CHE Project No:</b> 0843.C
Type of Work: Oysterbreak Breakwater Construction	Work Order: Task #4
Contractor's Representative(s) and Title: N/A	
Working Days: M T W T F S S	
Weather: Clear Rain Mist Hot Cold Warm Foggy Tempe	erature Range:50-60
Site Condition: Calm Windy Waves Winds: 15-20 mph winds from	ı SE
Personnel and Equipment on Site:	
Equipment:  Crane, American 9310A  Excavator, Komatsu PC 400 LC  Forklift, JLG G10-55A  Tugboat  Deck Barges (2)  Crew Boats (2)	
Contractor: Aquaterra Contracting, LLC	
Subcontractor(s): n/a	
Work Day: Yes ⊠ No □	
Work Conducted: Marine Mattress Assembly Marine Mattress Install Surveying Excavation Miscellaneous Metals Dredging (Access Char	· <u> </u>
No installation work was done today. The barges were positioned in Joseph' out. Load-out is expected to take two days. AquaTerra may attempt to place next week depending on weather prior to breaking for the holidays.	<u> </u>

• The following is a summary table of the installation to date:

Normal Weight Concrete	Design	<b>Inspected at Site</b>	Rejected at Site	Installed
with pegs	287	280	0	161
without pegs	334	334	0	189
Total	621	614	0	350
OysterKrete	Design	<b>Inspected at Site</b>	Rejected at Site	Installed
with pegs	287	0	0	0
without pegs	334	220	0	0
Total	621	220	0	0
Total	1,242	834	0	350
<b>Marine Mattresses</b>	Design	<b>Inspected at Site</b>	Rejected at Site	Installed
Mattresses	172	174	0	52

## **Completed to date:**

- 614 Normal Weight Concrete and 220 OysterKrete armor units have been delivered to the site.
- 350 Normal Weight Concrete armor units have been installed.
- 174 marine mattresses have been delivered to the site: 52 have been installed.

## **Discussions with Contractor and Outstanding Issues:**

■ CHE inspected the OysterKrete armor units that have been delivered to the site. 24 OysterKrete armor units were unaccounted for during the acceptance inspection that occurred on 12/15/2011 in Houston. CHE was unable to find any OysterKrete armor units who were being remade due to insufficient compressive strength testing at the stockpile site at Joseph's Harbor Bayou. However, CHE found 11 OysterKrete armor units (without pegs) who did not have a label to determine manufacture date. These units shall not be installed until the under-strength armor units can be accounted for.

## Problems/Issues Identified and Resolved:

■ N/A

Casey L. Connor, P.E.

Cyl Cu



<b>Project Name</b> : BioEngineered Oyster Reef Demonstration (LA-08) File #: R28059DL, PO#: 3726092	<b>Date</b> : 1/28/2012
Location: Rockefeller Wildlife Refuge	Contract No.: 2503-12-16 CHE Project No: 0843.C
Type of Work: Oysterbreak Breakwater Construction	Work Order: Task #4
Contractor's Representative(s) and Title: David Wiseman, Project Superintendent	lent; Thomas Gruber, Project
Working Days: M T W T F S S	
Weather: Clear Rain Mist Hot Cold Warm Foggy Tem	perature Range:50-68
Site Condition: Calm Windy Waves Winds: 15-20 mph winds from	om N
Personnel and Equipment on Site:	
Equipment:  Crane, American 9310A Excavator, Komatsu PC 400 LC Forklift, JLG G10-55A Tugboat Deck Barges (2) Crew Boats (2)	
Contractor: Aquaterra Contracting, LLC	
Subcontractor(s): Wayfarer Environmental Technologies, LLC	
Work Day: Yes No No	
Work Conducted: ☐ Marine Mattress Assembly ☐ Marine Mattress Install ☐ Surveying ☐ Excavation ☐ Miscellaneous Metals ☐ Dredging (Access Cl	<u> </u>
<ul> <li>199 OysterKrete armor units (98 with pegs; 101 without pegs) were instal</li> <li>Construction of the Normal Weight Concrete Breakwater B has been com</li> </ul>	<u> </u>



Figure 1: Today's progress of OysterKrete armor unit installation.



Figure 2: Normal Weight Concrete breakwater completed.

The following is a summary table of the installation to date (as of 1/28/12):

Normal Weight Concrete	Design	<b>Inspected at Site</b>	Rejected at Site	Installed
with pegs	287	287	0	287
without pegs	334	334	0	334
Total	621	621	0	621
OysterKrete	Design	<b>Inspected at Site</b>	Rejected at Site	Installed
with pegs	287	287	0	98
without pegs	334	316	0	117
Total	621	603	0	215
Total	1,242	1,224	0	836
Marine Mattresses Mattresses	<b>Design</b> 172	Inspected at Site 174	Rejected at Site	Installed 146

## **Completed to date:**

- Normal Weight Concrete Breakwater B has been constructed.
- 603 OysterKrete armor units have been delivered to the site; 215 have been installed.
- 174 marine mattresses have been delivered to the site; 146 have been installed.

#### **Discussions with Contractor and Outstanding Issues:**

• CHE inspected the OysterKrete armor units that have been delivered to the Joseph's Harbor airstrip location. One armor unit (see Figure 3) had a piece of wood embedded that will need to be removed and patched. If the armor unit can not be satisfactorily repaired the unit shall be replaced. Aquaterra planned on correcting this early next week as the weather outlook for installation is bad.



Figure 3: Wood embedded in OysterKrete armor unit.

• Aquaterra told CHE that 26 OysterKrete armor units without pegs at the Joseph's Harbor stockpile site had been rejected by Wayfarer for use on this project. These units were quarantined from the remaining units to prevent them from accidently being loaded onto the barge for installation. These units were not included in the above quantities table.

#### Problems/Issues Identified and Resolved:

■ N/A

Casey L. Connor, P.E. Coast & Harbor Engineering

Cyl Cu



Project Name: BioEngineered Oyster Reef Demonstration (LA-08) File #: R28059DL, PO#: 3726092	<b>Date</b> : 2/6/2012
Location: Rockefeller Wildlife Refuge	Contract No.: 2503-12-16
Type of Work: Oysterbreak Breakwater Construction	CHE Project No: 0843.C Work Order: Task #4
Contractor's Representative(s) and Title: David Wiseman, Project Superintender Superintendent	nt; Thomas Gruber, Project
Working Days:	
Weather: Clear Rain Mist Hot Cold Warm Foggy Tempe	erature Range:45-60
Site Condition: Calm Windy Waves Winds: 15-20 mph winds from	ı N
Personnel and Equipment on Site:	
Equipment:  Crane, American 9310A  Excavator, Komatsu PC 400 LC  Forklift, JLG G10-55A  Tugboat  Deck Barges (2)  Crew Boats (2)	
Contractor: Aquaterra Contracting, LLC	
Subcontractor(s): Wayfarer Environmental Technologies, LLC	
Work Day: Yes ⊠ No □	
Work Conducted: ☐ Marine Mattress Assembly ☒ Marine Mattress Install ☒ ☐ Surveying ☐ Excavation ☐ Miscellaneous Metals ☐ Dredging (Access Char	-
<ul> <li>105 OysterKrete armor units (49 with pegs; 56 without pegs) were installed marine mattresses were also installed.</li> </ul>	today (see Figure 1). 16

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Figure 1: Today's progress of OysterKrete armor unit installation (tide is at approx. MSL).

The following is a summary table of the installation to date (as of 2/6/12):

Normal Weight Concrete	Design	Inspected at Site	Rejected at Site	Installed
with pegs	287	287	0	287
without pegs	334	334	0	334
Total	621	621	0	621
OysterKrete	Design	Inspected at Site	Rejected at Site	Installed
with pegs	287	287	0	273
without pegs	334	334	0	317
Total	621	621	0	590
Total	1,242	1,242	0	1,211
<b>Marine Mattresses</b>	Design	Inspected at Site	Rejected at Site	Installed
Mattresses	172	174	0	172

## **Completed to date:**

- Normal Weight Concrete Breakwater B has been constructed.
- 621 OysterKrete armor units have been delivered to the site; 590 have been installed.

2/6/2012 Site Visit Report Page 2 of 3

• 174 marine mattresses have been delivered to the site (2 extra); 172 have been installed.

## **Discussions with Contractor and Outstanding Issues:**

■ N/A

## Problems/Issues Identified and Resolved:

■ N/A

Casey L. Connor, P.E.

G/M



Project Name: BioEngineered Oyster Reef Demonstration (LA-08) File #: R28059DL, PO#: 3726092	<b>Date</b> : 2/7/2012
Location: Rockefeller Wildlife Refuge	Contract No.: 2503-12-16
Type of Work: Oysterbreak Breakwater Construction	CHE Project No: 0843.C Work Order: Task #4
Contractor's Representative(s) and Title: David Wiseman, Project Superintender Superintendent	nt; Thomas Gruber, Project
Working Days: M M T W T F S S	
Weather: ⊠Clear □Rain □Mist □Hot □Cold ⊠Warm □Foggy Tempe	erature Range:45-65
Site Condition: Calm Windy Waves Winds: 5-10 mph winds from	NE
Personnel and Equipment on Site:	
Equipment:  Crane, American 9310A Excavator, Komatsu PC 400 LC Forklift, JLG G10-55A Tugboat Deck Barges (3) Crew Boats (2)	
Contractor: Aquaterra Contracting, LLC	
Subcontractor(s): Wayfarer Environmental Technologies, LLC; Fenstermaker	
Work Day: Yes No No	
Work Conducted: ☐ Marine Mattress Assembly ☐ Marine Mattress Install ☒ ⊙ Surveying ☐ Excavation ☐ Miscellaneous Metals ☐ Dredging (Access Char	
<ul> <li>31 OysterKrete armor units (14 with pegs; 17 without pegs) were installed to complete Breakwater A.</li> <li>Piles for navigation aids N-1 and N-2 have been installed (see Figure 2).</li> <li>CPRA (Darrel Pontiff, Tommy McGinnis, and Pat Landry) and NOAA (John conduct a site visit. While on site CHE, CPRA, and NOAA conducted a Sub Inspection (see attached).</li> </ul>	n Foret) were on-site to

2/7/2012 Site Visit Report Page 1 of 3



Figure 1: Today's progress of OysterKrete armor unit installation.



Figure 2: Pile for navigation aid N-2.

2/7/2012 Site Visit Report Page 2 of 3

• The following is a summary table of the installation to date (as of 2/7/12):

Normal Weight Concrete	Design	<b>Inspected at Site</b>	Rejected at Site	Installed
with pegs	287	287	0	287
without pegs	334	334	0	334
Total	621	621	0	621
OysterKrete	Design	Inspected at Site	Rejected at Site	Installed
with pegs	287	287	0	287
without pegs	334	334	0	334
Total	621	621	0	621
Total	1,242	1,242	0	1,242
<b>Marine Mattresses</b>	Design	Inspected at Site	Rejected at Site	Installed
Mattresses	172	176	0	172

## **Completed to date:**

- OysterKrete Breakwater A has been constructed.
- Normal Weight Concrete Breakwater B has been constructed.
- 176 marine mattresses have been delivered to the site (4 extra); 172 have been installed.
- 2 piles for navigations aids have been installed.

#### **Discussions with Contractor and Outstanding Issues:**

- CHE discussed marine mattress installation. Aquaterra will place an additional 4 marine mattresses in excess of the design value of 172 tomorrow (2/7/2012). Aquaterra requested to install them at the project site in lieu of transporting them off-site. CHE discussed placement options with NOAA (John Foret) and CPRA (Darrel Pontiff, Pat Landry, and Tommy McGinnis) and decided that 2 mattresses will be installed on each side of the gap separating Breakwaters A and B. The additional mattresses will be placed directly adjacent to the marine mattresses previously placed.
- CHE discussed pile installation. Pile lengths were designed to have 1 ft cut from the end due to potential damage during pile driving. However, if no damage has been done to the tip during pile driving, such as in the event of vibratory driving, the pile tip does not need to be cut off. The top of the pile shall still be driven to +15 ft NAVD88 as shown in the Contract Documents.

#### Problems/Issues Identified and Resolved:

■ N/A

Casey L. Connor, P.E.

G/ Cm



Project Name: BioEngineered Oyster Reef Demonstration (LA-08) File #: R28059DL, PO#: 3726092	<b>Date</b> : 2/8/2012				
Location: Rockefeller Wildlife Refuge	Contract No.: 2503-12-16 CHE Project No: 0843.C				
Type of Work: Oysterbreak Breakwater Construction	· ·				
Contractor's Representative(s) and Title: David Wiseman, Project Superintender Superintendent	nt; Thomas Gruber, Project				
Working Days: M T W T F S S					
Weather: ⊠Clear □Rain □Mist □Hot □Cold ⊠Warm □Foggy Tempe	rature Range:52-65				
Site Condition: Calm Windy Waves Winds: 15-20 mph winds from N					
Personnel and Equipment on Site:					
Equipment:  Crane, American 9310A  Excavator, Komatsu PC 400 LC  Forklift, JLG G10-55A  Tugboat  Deck Barges (3)  Crew Boats (2)					
Contractor: Aquaterra Contracting, LLC					
Subcontractor(s): Wayfarer Environmental Technologies, LLC; Fenstermaker					
Work Day: Yes ⊠ No □					
Work Conducted: ☐ Marine Mattress Assembly ☐ Marine Mattress Install ☐ Surveying ☐ Excavation ☐ Miscellaneous Metals ☐ Dredging (Access Char					
<ul> <li>Piles for navigation aids N-3 and N-4 have been installed (see Figure 1).</li> <li>Navigation aid N-2 has been completed (see Figure 2).</li> <li>4 extra marine mattresses were installed between Breakwaters A and B from 3+45 to 3+50.</li> </ul>	Sta 2+15 to 2+20 and Sta				

2/8/2012 Site Visit Report Page 1 of 3



Figure 1: Installation of piles for navigation aids N-3 and N-4.



Figure 2: Complete navigation aid N-2.

2/8/2012 Site Visit Report Page 2 of 3

The following is a summary table of the installation to date (as of 2/8/12):

Normal Weight Concrete	Design	<b>Inspected at Site</b>	Rejected at Site	Installed
with pegs	287	287	0	287
without pegs	334	334	0	334
Total	621	621	0	621
OysterKrete	Design	<b>Inspected at Site</b>	Rejected at Site	Installed
with pegs	287	287	0	287
without pegs	334	334	0	334
Total	621	621	0	621
Total	1,242	1,242	0	1,242
<b>Marine Mattresses</b>	Design	<b>Inspected at Site</b>	Rejected at Site	Installed
Mattresses	172	176	0	176

#### **Completed to date:**

- OysterKrete Breakwater A has been constructed.
- Normal Weight Concrete Breakwater B has been constructed.
- 2 extra marine mattresses were installed on each side of the gap separating Breakwaters A and B (4 total).
- 4 piles for navigations aids have been installed, one navigation aid is complete.

### **Discussions with Contractor and Outstanding Issues:**

- CHE discussed piling touch-ups. All piling touch-ups and field welds shall be coated with the approved Carboline® coating in 2 coats and applied with a brush or roller as per TS 15.11.
- CHE discussed navigation aid installation. The dayboard shall be installed such that the bottom of the board is higher than +7.6 ft NAVD88 and the top of the board is lower than +15.0 ft NAVD88. For consistency, Aquaterra will be installing them such that the bottom of the board is at approximately +7.6 ft NAVD88. Aquaterra believes the remaining three navigation aids will be completed tomorrow (2/9/2012).

#### Problems/Issues Identified and Resolved:

• Aquaterra did not submit a submittal for galvanized coating touch-up as per TS 14.6.A.4. The galvanized steel plate the marine light fastens to had to be drilled for a different bolt pattern in the field and therefore touch-up of the galvanized coating was required. Aquaterra proposed to use "Cold Galvanizing Compound" manufactured by RUST-OLEUM® to touch-up the galvanized coating. CHE determined that while Aquaterra had not provided a submittal for this product the product did meet requirements stated in the Contract Documents and is therefore allowed for use on the project. Aquaterra must still submit an official submittal for the product.

Casey L. Connor, P.E.

Colle

Coast & Harbor Engineering

2/8/2012 Site Visit Report Page 3 of 3

# APPENDIX C Change Orders

#### **CHANGE ORDER NO. 1**

OWNER:

State of Louisiana, Coastal Protection and Restoration Authority

CONTRACTOR:

AquaTerra Contracting LP

PROJECT:

Bioengineered Oyster Reef Demonstration Project (LA-08)

FILE NO:

R28059DL

**PURCHASE ORDER NO:** 

3726092

ENGINEER:

Coast & Harbor Engineering, Inc.

The following changes are hereby proposed to be made to the Contract Documents:

- Increase contract quantity for Item No. 3, "Oysterbreak Armor Units (Oysterkrete) Fabricate and Deliver", from 621 units to 631 units.
- Increase contract quantity for Item No. 4, "Oysterbreak Armor Units (Normal Weight Concrete) –
   Fabricate and Deliver", from 621 units to 629 units.
- Increase contract quantity for Item No. 5, "Oysterbreak Armor Unit Install", from 1,242 to 1,260 units.
- Increase contract quantity for Item No. 6, "Marine Mattress", from 18,060 SF to 18,480 SF.
- Add pay Item No. 8, "Credit for Marine Mattress Geotextile Material", Lump Sum.

Description: See attached summary.

Attachments (list documents supporting change):

- Letter of Request for Change Order from Coast & Harbor Engineering, dated November 11, 2011 (5 sheets).
- Letter of Request for Change Order from AquaTerra Contracting LP, dated November 15, 2011 (3 sheets).
- Submittal TS-11(E) R2 for Geotextile Data and Test Reports, dated November 10, 2011 (3 sheets).

Change in Contract Pr	ice	Change in Contract Time	
Original Contract Price	\$1,456,620.00	Original Contract Time (calendar days)	210
Net Increase (Decrease) from previous Change Orders	\$ -	Net Increase (Decrease) from previous Change Orders (days)	0
Contract Price prior to this Change Order	\$1,456,620.00	Contract Time prior to this Change Order (calendar days)	210
Net Increase (Decrease) of this Change Order	\$ 21.950.82	Net Increase (Decrease) of this Change Order (days)	0
Contract Price with this Change Order	\$1,478,570.82	Contract Time with this Change Order (calendar days)	210

		स स
RECOMMENDED:	RECOMMENDED:	ACCEPTED:
By: #3	By: Danel Portoff	By: BIL Duos
CPRA Design Engineer	CPRA Construction Manager	Contractor
Date: 2/27/2017	Date: 2/21/2012	Data 2/27/2017

## BIOENGINEERED OYSTER REEF DEMONSTRATION PROJECT (LA-08) FILE NO: R28059DL, PURCHASE ORDER NO: 3726092

#### SUMMARY OF CHANGE ORDER NO. 1

Item No.	Item Description	Original Quantity	Adjusted Quantity	Unit	Unit Cost	Amount Overrun	Amount Underrun
3	Oysterbreak Armor Units (Oysterkrete) - Fabricate and Deliver	621	631	Each	\$ 620.00	\$ 6,200.00	\$ -
4	Oysterbreak Armor Units (Normal Weight Concrete) - Fabricate and Deliver	621	629	Each	\$ 610.00	\$ 4,880.00	\$ -
5	Oysterbreak Armor Units - Install	1,242	1,260	Each	\$ 90.00	\$ 1,620.00	\$ -
6	Marine Mattress	18,060	18,480	SF	\$ 23.50	\$ 9,870.00	\$ -
8	Credit for Marine Mattress Geotextile Material	0	1	LS	\$ (619.18)	\$ -	\$ (619.18)
Total A	Amount Overrun					\$22,570.00	
Total A	Amount Underrun						\$ (619.18)
Net Inc	crease (Decrease) of this Change Orde	er					\$21,950.82

#### **JUSTIFICATION:**

Change Order No. 1 increases contract quantity for Item No. 3, "Oysterbreak Armor Units (Oysterkrete) – Fabricate and Deliver", from 621 units to 631 units. The increase in quantity adjusts the contract quantity to reflect the actual as-built quantity.

Change Order No. 1 increases contract quantity for Item No. 4, "Oysterbreak Armor Units (Normal Weight Concrete) – Fabricate and Deliver", from 621 units to 629 units. The increase in quantity adjusts the contract quantity to reflect the actual as-built quantity.

Change Order No. 1 increases contract quantity for Item No. 5, "Oysterbreak Armor Units – Install", from 1,242 to 1,260 units. The increase in quantity adjusts the contract quantity to reflect the actual as-built quantity.

Change Order No. 1 increases contract quantity for Item No. 6, "Marine Mattress", from 18,060 SF to 18,480 SF. The increase in quantity adjusts the contract quantity to reflect the actual as-built quantity.

Change Order No. 1 adds pay item (No. 9, "Credit for Marine Mattress Geotextile Material") for the decrease in price due to an incorrect geotextile attached to 54 of the required 172 marine mattresses. The geotextile provided weighed 12 oz/sqyd, while the Contract Documents required 16 oz/sqyd. The incorrect geotextile was determined to provide adequate performance for 54 marine mattresses and will not require a change in the geotextile material. The remaining 118 marine mattresses shall be fabricated with the required 16 oz/sqyd as stated in the Contract Documents.

Change Order No. 1 does not add any days to the contract time to accomplish the work for the change order item.



November 11, 2011

Blake Dwoskin AquaTerra Contracting LP 11498 Luna Road, Suite 106 Dallas, TX 75234

Re: Bioengineered Oyster Reef Demonstration Project (LA-08)

File Number: R 28059 DL

PO #: 3726092

#### Mr. Dwoskin:

A representative of Tensar, AquaTerra Contracting's sub-contractor, identified that Tensar had provided an incorrect geotextile material attached to the 172 marine mattresses. The incorrect geotextile was identified on October 19, 2011 after 54 of the 172 required marine mattresses had been fabricated as stated in AquaTerra's Daily Progress Report Form dated October 20, 2011 (see attached). The geotextile provided weighed 12 oz/sqyd, while the Contract Documents required 16 oz/sqyd.

AquaTerra Contracting submitted information from US Fabrics, Tensar's geotextile supplier, providing testing data for the 12 oz/sqyd geotextile (US 300NW) for review on November 10, 2011 (see attached). The 12 oz/sqyd geotextile was determined to provide adequate performance for 54 marine mattresses and will not require a change in the geotextile material. This decision was reached after reviewing the testing data and considering the potential impacts to the project.

The time necessary to re-fabricate and re-ship the 54 marine mattresses with the required 16 oz/sqyd would be significant with a negligible increase in performance. In addition, field changes to the marine mattresses pose a potential for a strength reduction due to excessive working of the marine mattresses which could present a safety issue during lifting operations.

Therefore, the Coastal Protection and Restoration Authority requests a credit for the price difference between the 12 oz/sqyd and 16 oz/sqyd geotextile on the 54 marine mattresses. The remaining 118 marine mattresses shall be fabricated with the required 16 oz/sqyd as stated in the Contract Documents.

Bioengineered Oyster Reef Demonstration Project (LA-08)

File Number: R 28059 DL

PO #: 3726092 November 11, 2011

Page 2

Each marine mattress includes 161 sqft of geotextile (23 ft x 7 ft). Therefore, a total of 8,694 sqft of the incorrect geotextile has been installed. Please provide details outlining the change in cost between the 12 oz/sqyd and 16 oz/sqyd geotextile.

Please contact me at josh@coastharboreng.com or (512) 342-9707 if you have questions or need any additional information.

Sincerely,

Josh Carter, P.E.

Coast & Harbor Engineering, Inc.

enclosure

cc: Mr. Darrell Pontiff, P.E., CPRA Mr. Tye Fitzgerald, CPRA

### **DAILY PROGRESS REPORT FORM**

Contractors Name AQUATERRA CONTRACTING LP	
Daily Report No: 80 Contract No: R 28059 DL	Date: <u>10-20-2011</u>
	engineered Oyster Reef Demonstration Project Cameron
Parish, LA	ongmoored by the record bemondtration region burneron

1. Dollar Amount of All Bid Items Performed Today: N/A

Bid Item	Quantity	Unit	Unit Price	\$ Amount Performed
Mob/Demob		Lump Sum	\$79,000.00	
Surveys		Lump Sum	\$36,000.00	
Oysterkrete Fab. & Delv.		Each	\$620.00	
Normal Weight Fab. & Delv.		Each	\$610.00	
Oysterbreak Installation		Each	\$90.00	
Marine Mattress		Square Feet	\$23.50	
Navigational Aids		Each	\$10,400.00	

2. Notes on All Inspections:

Inspection Conducted	LOCATION	RESULTS
Concrete Testing	Old Castle - Houston	See Attached

## DAILY PROGRESS REPORT FORM (CONT'D)

3. Field Notes on All Surveys: (See Attached) N/A

5. A Brief Des Amendmen		nge Orders, Field O	rders, Claims, Clarif	ications, or
ATI submits & CHE	E responds to RFI 0			
	ved submittal TS-11	\ /		
			as installed on the N	
		<u> </u>	54 Mattresses with	
ATI sends remainir	ng 118 Mattresses b	pack to fabricator in	order to have the 16	oz. fabric replace
the 12 oz.				
ATI takes sample f	rom a filled Mattress	s in order to send to	Testing Lab for Fie	ld Test results.
ATI requests to add	d an 8 oz. fabric to t	he 12 oz – to be ba	sed on permittivity to	ests.
6. Condition o	f All Navigational Ai	ds and Any Repairs	Performed on Ther	n:
7. Weather Co	onditions: Wind Speed &	Temperature	Wave Height	Precipitation
Weather Day (Yes/No)	Direction	remperature	wave neight	Frecipitation

75

NE 5

No

N/A

0.0

## DAILY PROGRESS REPORT FORM (CONT'D)

8. Amount of Time Lost to	Severe Weather or Personal Inju	ry, etc.:
Zero		
Compiling Submittal Data – On ATI Filling Marine Mattresses –	Schedule. Need to Submit Pre-c 54 cumulative total.	on Surveys.
10. Visitor Log: <b>N/A</b>		
Visitor	Representing	Contact Information
Visitor Representing Contact Inform		
Visitor Representing Contact Info		
	11. Remarks: (Instructions received or given. Conflicts in Plans and/or Specifications.	
`	eceived or given. Conflicts in Pla	ns and/or Specifications.)
and all materials and equipmen	nalf of the contractor, I certify this t used and work performed during specifications, to the best of my k	g this reporting period are in
David Wiseman Authorized CQC System N		)-2011

## **AquaTerra Contracting LP**

11498 Luna Road, Suite 106 Dallas, TX 75234

November 15, 2011

To: Josh Carter P.E.

Coast and Harbor Engineering

512-342-9707

Re: Bioengineered Oyster Reef Demonstration Project (LA-08)

File Number: R 28059 DL

PO #: 3726092

General Correspondence – Geotextile Credit

#### Mr. Carter:

Aquaterra is in receipt of your request for credit dated November 11, 2011. In response to such request we offer the following:

Phone: (972) 869-9008

Fax:

(972) 869-4005

- Difference in material price (12 ounce fabric in lieu of 16 ounce fabric) \$425.04. See attached email response from Tensar. The difference in pricing includes Profit and Transportation.
- G&A for Tensar @ 9.5% \$40.38
- Aquaterra reduction in Field Overhead, G&A, Profit, Bond & General Liability \$153.76.
- Total Credit \$619.18. See attached Credit Summary Sheet.

We appreciate your consideration of this change in Geotextile Fabric for the referenced 54 mattresses and request acceptance of the offered credit.

Thank you Blake Dwoskin

Aquaterra Contracting LP 281-330-8114 (direct)

BIL Two.

#### **Blake Dwoskin**

From: Jeff Fiske <JFiske@tensarcorp.com>
Sent: Friday, November 11, 2011 12:45 PM

To: Blake Dwoskin
Cc: Laura Reaves

**Subject:** RE: LA-08 CO-01 request

Blake,

The difference in cost between the two products works out to \$425.04.

54 each 7'x23' Fabric Panels 966 sq yd total 12 oz fabric \$2.00 / SYD 16 oz fabric \$2.44 / SYD

\$0.44 x 966 \$425.04

If this is agreeable to you, Tensar will issue a credit ASAP.

Best regards,

Jeff Fiske | Coastal & Waterway Industry Manager



Tensar International Corporation | 2500 Northwinds Pkwy | Suite 500 | Alpharetta, GA 30009 | Direct: 770-344-2123 | Cell: 678-576-6123 | Fax: 770-344-2084 | jfiske@tensarcorp.com | www.tensarcorp.com

From: Blake Dwoskin [mailto:bdwoskin@aquaterracontracting.com]

Sent: Friday, November 11, 2011 11:48 AM

To: Jeff Fiske

Subject: FW: LA-08 CO-01 request

Jeff – CHE on behalf of the OCPR has requested a credit for the utilization of the 12 ounce fabric in lieu of the 16 ounce. Please review and respond to me on the matter.

Thanks
Blake Dwoskin
Aquaterra Contracting
281-330-8114

From: Josh Carter [mailto:josh@coastharboreng.com]

**Sent:** Friday, November 11, 2011 10:35 AM

To: Blake Dwoskin

Cc: 'Casey Connor'; 'Hugo Bermúdez'; 'Darrell Pontiff (DNR)'

Subject: LA-08 CO-01 request

Blake,

LA-08 Bioengineered Oyster Reef Demo File No. R28059 DL - PO 3726092 Modification: 1A



#### AQUATERRA CONTRACTING 11498 Luna Road, Suite 106, Dallas, TX 75234 Office (972) 869-9008 Fax (972) 869-4005

#### Geotextile Credit

Description		Labor	Ope	rated EQ	s	tby. EQ	P	Materials	S	upplies		Sub-K		Total
Service Loads & Tip Elevations	\$	-	\$	-	\$	-	\$	465.42	\$	-	\$	-	\$	465.4
Indirect Cost		5.96%		5.96%		5.96%		5.96%		5.96%		5.96%		5.96%
	T						Г				Г		Г	
Subtotal	\$	-	\$	-	\$	-	\$	493.16	\$	-	\$	-	\$	493.16
G&A		9.38%		9.38%		9.38%		9.38%		9.38%		9.38%		9.38%
	\$	1	\$	1	\$	-	\$	46.26	\$	-	\$	-	\$	46.26
	\$	-	\$		\$	-	\$	539.42	\$	-	\$	-	\$	539.42
Profit		13.11%		13.11%		13.11%		13.11%		13.11%		13.11%		13.11
	\$	-	\$	-	\$	-	\$	70.72	\$	-	\$	-	\$	70.72
	\$	-	\$	-	\$	-	\$	610.13	\$	-	\$	-	\$	610.13
Bond												1.03%	\$	6.28
General Liability (Revenue Driven)												0.45%	\$	2.77
TOTAL											\$			619.18

	SHOP DRAW	/ING/MATERIAL APPROV	AL RE	QUEST		
	LA-08 Bioengineered O	yster Reef Demonstration Project FILE #:	R28059DL	PO #: <u>372609</u>	2	
FROM: CONTRA	CTOR AQUATERRA CONTR.	ACTING LP				
CONTRAC	T NUMBER R28059DL	SUBMISSION NUMBER TS-11(E) R2	DATE	10-Nov-11		
	ORE FORMS REQUIRED  NO  YES	TYPE OF SUBMITTAL  NEW RESUBMITTAL OF # 1	G	OVERNMENT	USE ONLY	
ITEM NO	SPECIFICATION SECTION AND PARAGRAPH NO	DESCRIPTION OF MATERIAL	APPRO VED	AP PROVED AS NOTED	DISAP PROVED	INT
1	TS-11.4-E	Geotex & Geogrid Test Reports (Rev 1)	_			
CONTRAC		LS COMPLY WITH THE CONTRACT REQUIR	RMENTS.			
	NO OF COPIES TO	BY (NAME AND TITLE) Blake Dwoskin Project MGR	BIL	SIGNAT	•>2	•
	12 Ounce Geotextile Data & T	This review is only for general conformance we mation given in the Construction Documents. On shop drawings during this review do not relieve the requirements of the plans and specification include review of an useembly of which the literasponsible for dimensions to be confirmed and that permins solely to the fabrication processes of mequances and procedures of construction; confirmed and performing all Work in a safe.  Coast & Harbor E.	D Revise a  Submit: th the design corrections or a the contractor a lieview of a is a compor correlated at or to the mean relation of th and satisfactor	comments made r from complians specific item sh sent. The Contra the jobsite; infor- s, methods, techs work with the ry manner.	e infor- on the see with all not setter is mation	
	FC	R ENGINEER AND OWNER USE ON	ILY			
TO: CONT	PACTING OFFICER	GOAST AND HARBOR ENGINEERING				
RECOMMEN	RACTING OFFICER  D APPROVAL OR	DISAPPROVAL OR CORRECT PER APPICABLE	COMMENTS	ABOVE		
	PED NAME AND GRADE	SIGNATURE		DATE		
		CONTRACTING OFFICER	*			
2. REQUEST	END APPROVAL OR PROMPT RESUBMITTAL OF <b>DISA</b>	DISAPPROVAL OR CORRECT PER APPICABLE	COMMENTS	ABOVE.		
TYI	PED NAME AND GRADE	SIGNATURE		DATE		

Γ

Product: US 300NW/TG 800

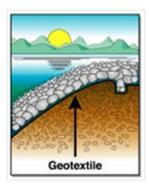
ROLL#	*THOIBW	MD	MD	DMX	XMD	MD	XMD	PUNCTURE	AOS	WATER	PERMITTIVIT
		TENSILE	ELONG	TENSILE	ELONG	TRAP	TRAP			FLOW	!
ASTM METHOD	D5261	D4632	D4632	D4632	D4632	D4533	D4533	D4833	D4751	D4491	D4491
ONITS	oz/sq yd	lbs.	%	lbs	%	lbs.	lbs	lbs.	US Sieve	gpm/ft <sup>2</sup>	sec-1
Target	12.00	300	50	300	50	115	115	180	100	75	1.00
140315648	11.64	303	67	331	74	120	138	191	100	82	1.09
140315649	11.64	303	67	331	74	120	138	191	100	82	1.09
140315650	12.26	312	75	336	77	123	145	195	100	82	1.09
140315651	12.26	312	75	336	77	123	145	195	100	82	1.09
140315652	12.26	312	75	336	77	123	145	195	100	82	1.09
140315653	12.26	312	75	336	77	123	145	195	100	82	1.09
140315654	12.26	312	75	336	77	123	145	195	100	82	1.09
140315655	11.73	306	70	333	72	123	145	195	100	82	1.09
140315656	11.73	306	70	333	72	123	145	195	100	82	1.09
140315657	11.73	306	70	333	72	123	145	195	100	82	1.09
140315658	11.73	306	70	333	72	123	145	195	100	82	1.09
140315659	11.73	306	70	333	72	123	145	195	100	82	1.09
140315660	12.17	315	73	339	80	118	140	188	100	82	1.09
140315661	12.17	315	73	339	80	118	140	188	100	82	1.09

## **US 300NW**

## **Nonwoven Geotextile**



US 300NW is a nonwoven needlepunched geotextile made of 100% polypropylene staple filaments. This product can be used under riprap for erosion control; for separation in road and railroad applications; and will act as a cushion in geomembrane applications. US 300NW meets the following M.A.R.V. values except where noted:





PROPERTY	TEST METHOD	ENGLISH	METRIC
Weight - Typical	ASTM D-5261	12 oz/sy	407 g/sm
Tensile Strength	ASTM D-4632	300 lbs	1,335 N
Elongation @ Break	ASTM D-4632	50%	50%
Mullen Burst	ASTM D-3786	580 psi	3,999 kPa
Puncture Strength	ASTM D-4833	180 lbs	801 N
CBR Puncture	ASTM D-6241	850 lbs	3,782 N
Trapezoidal Tear	ASTM D-4533	115 lbs	511 N
Apparent Opening Size	ASTM D-4751	100 US Sieve	0.150 mm
Permittivity	ASTM D-4491	1.00 Sec-1	1.00 Sec-1
Water Flow Rate	ASTM D-4491	75 g/min/sf	3,055 l/min/sm
UV Resistance @ 500 Hours	ASTM D-4355	70%	70%

ROLL SIZE	AREA	WEIGHT
12.5' x 360'	500 sys	375 lbs
15' x 300'	500 sys	375 lbs

The above information is to the best of our knowledge accurate, but it is not intended to be considered a guarantee. Any implied warranty for a particular use or purpose is excluded. If the product does not meet the above properties, and notice is given to US Fabrics, Inc., the product will be replaced or refunded (5/2010).

## APPENDIX D

**Pre and Post Aerial Images** 

### **Pre and Post Aerial Images**



PRE-CONSTRUCTION AERIAL IMAGE
DOQQ From Louisiana Satewide GIS, Dated 2005



**POST-CONSTRUCTION AERIAL IMAGE**Flown by Gulf Coast Aerial Mapping (225) 355-9722 on 3/24/2012

## Pre and Post Aerial Images Project Extents



PRE-CONSTRUCTION AERIAL IMAGE
DOQQ From Louisiana Satewide GIS, Dated 2005



POST-CONSTRUCTION AERIAL IMAGE
Flown by Gulf Coast Aerial Mapping (225) 355-9722 on 3/24/2012

## APPENDIX E

**As-Built Drawings** 

## STATE OF LOUISIANA OFFICE OF COASTAL PROTECTION & RESTORATION RESTORATION ENGINEERING DIVISION

## BIO-ENGINEERED OYSTER REEF DEMONSTRATION PROJECT

STATE PROJECT NUMBER LA-08 CAMERON PARISH, LOUISIANA

#### INDEX TO SHEETS

#### SHEET NO. DESCRIPTION

- TITLE SHEET
- GENERAL NOTES
- PROJECT AREA AND CONTRACTOR USE AREA
- SITE PLAN
- TYPICAL SECTIONS
- OYSTERBREAK ARMOR UNITS
- MARINE MATTRESS DETAILS
- MARINE MATTRESS DETAILS
- NAVIGATION AID
- INITIAL MONITORING SURVEY PLAN
- 11. POST-CONSTRUCTION MONITORING SURVEY PLAN
- EXISTING BATHYMETRIC SECTIONS



MONITORING SURVEY BATHYMETRIC SECTIONS MONITORING SURVEY BATHYMETRIC SECTIONS

MONITORING SURVEY BATHYMETRIC SECTIONS

MONITORING SURVEY BATHYMETRIC SECTIONS







### VICINITY MAP





OCPR CHIEF OF RESTORATION ENGINEERING DIVISION

STATE OF LOUISIANA

OCPR ENGINEER MANAGER

OCPR PROJECT ENGINEER

COAST & HARBOR ENGINEERING



#### TYPE OF CONSTRUCTION

CLASSIFICATION III (Heavy Construction)

COAST & HARBOR ENGINEERING 3410 FAR WEST BLVD., SUITE 210 AUSTIN, TX 78731 PH 512-342-9516 FAX 512-342-9708				
	С	3/30/2012	AS-BUILT DRAWINGS	SI
	В	11/10/2011	FOR CONSTRUCTION	C
SUBMITTED UNDER THE AUTHORITY OF HUGO E. BERMUDEZ, P.E. 30107	Α	4/20/2011	FOR BID	S
	REV.	DATE	DESCRIPTION	B,

LOUISIANA OFFICE OF COASTAL	
PROTECTION AND RESTORATION	
RESTORATION ENGINEERING DIVISION	
450 LAUREL ST.	
NORTH CHASE TOWER, SUITE 1150-6	

		NORTH CHASE T	UREL ST. OWER, SUITE 1150-6 , LOUISIANA 70804		
DRAWN BY:	TM		DESIGNED BY:	SH	

BIO-ENGINEERED OYSTER REEF DEMONSTRATION PROJECT	TITLE SHEET
STATE PROJECT NUMBER: LA-08	
FEDERAL PROJECT NUMBER: LA-08	DATE: 3/30/12
APPROVED BY: RUSS JOFFRION, P.E.	SHEET 1 OF 16

#### **SURVEY NOTES:**

- TOPOGRAPHIC AND HYDROGRAPHIC SURVEY POINTS WERE COLLECTED BY C.H. FENSTERMAKER & ASSOCIATES FROM OCTOBER 2011 TO FEBRUARY 2012.
- 2. ALL ELEVATIONS ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88) IN U.S. SURVEY FEET.
- 3. ALL HORIZONTAL COORDINATES ARE REFERENCED TO THE NORTH AMERICAN DATUM OF 1983 (NAD83) LOUISIANA STATE PLANE, SOUTH ZONE, FEET.
- 4. SURVEY MONUMENT ME-18-SM-01 HAS BEEN ESTABLISHED NEAR THE PROJECT SITE. REFER TO SHEET 3 FOR SURVEY CONTROL LOCATIONS. CONTRACTOR SHALL BE RESPONSIBLE TO ESTABLISH AND MAINTAIN TEMPORARY BENCHMARKS DURING CONSTRUCTION AS NEEDED, SEE APPENDIX D FOR SURVEY DATA SHEET.
- 5. CONDITION AND ACCURACY OF SURVEY MONUMENT IS NOT GUARANTEED. CONTRACTOR SHALL VERIFY THE ACCURACY OF SURVEY CONTROL MONUMENTS PRIOR TO CONSTRUCTION. IMMEDIATELY REPORT ANY DISCREPANCIES TO ENGINEER.
- 6.) AERIAL PHOTOGRAPH: (SHEETS 1 & 3) FROM THE LA STATEWIDE GIS, DATED 2005. (SHEETS 10 & 11) FROM GULF COAST AERIAL MAPPING (225) 355-9722, DATED MARCH 24, 2012.

#### **GENERAL NOTES:**

- 1. PRIOR TO COMMENCEMENT OF THE WORK, THE CONTRACTOR SHALL CALL LOUISIANA ONE CALL AT 1-800-272-3020 A MINIMUM OF 5 DAYS PRIOR TO CONSTRUCTION TO LOCATE EXISTING UTILITIES IN THE PROJECT SITE. THE CONTRACTOR SHALL CONDUCT THE WORK IN SUCH A MANNER AS TO COOPERATE AND MINIMIZE INCONVENIENCES WITH UTILITIES. ANY UNIDENTIFIED PIPES OR STRUCTURES WHICH MAY BE DISCOVERED WITHIN THE LIMITS OF THE PROJECT SITE SHALL NOT BE DISTURBED. CONSTRUCTION OR EXCAVATION SHALL NOT BE PERFORMED AT THESE LOCATIONS WITHOUT APPROVAL FROM THE ENGINEER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING PIPELINE AND UTILITY OPERATORS AT LEAST 72 HOURS IN ADVANCE OF WORK.
- 2. THE CONTRACTOR SHALL PERFORM A MAGNETOMETER SURVEY WITHIN THE PROJECT WORK LIMITS (AS SHOWN ON SHEET 4) AND LOCATE ALL UTILITIES AND OBSTRUCTIONS PRIOR TO COMMENCING WORK. ALL PIPELINES AND UNDERGROUND UTILITIES SHALL BE MARKED WITH BUOYS BY CONTRACTOR. CONTRACTOR SHALL MAINTAIN BUOYS DURING CONSTRUCTION. CONTRACTOR SHALL NOT ANCHOR SPUD OR EXCAVATE WITHIN 100 FEET OF ANY PIPELINE. RESULTS OF THE MAGNETOMETER SURVEY SHALL INCLUDE: DRAWINGS SHOWING ALL TRACK LINES, COORDINATES, AMPLITUDES, SIGNATURE TYPES, AND SIGNATURE WIDTHS OF ALL HITS SHALL BE SUBMITTED TO THE ENGINEER A MINIMUM OF 14 DAYS PRIOR TO THE START OF CONSTRUCTION, SEE SPECIFICATIONS. TS—7.
- 3. THE CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGE TO EXISTING UTILITITIES CAUSED BY THE CONTRACTOR'S NEGLIGENCE. THE DAMAGE SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE.
- 4. LOCATION OF UTILITIES, INCLUDING PIPELINES, INDICATED ON THE DRAWINGS ARE FOR INFORMATIONAL PURPOSES ONLY AND ARE BASED IN PART ON INFORMATION PROVIDED BY THE RESPECTIVE UTILITY COMPANIES. IT IS THE CONTRACTORS RESPONSIBILITY TO VERIFY ALL EXISTING UTILITY LOCATIONS PRIOR TO CONSTRUCTION.
- 5. CONTACT INFORMATION FOR THE KNOWN PIPELINES IN THE PROJECT AREA IS PROVIDED BELOW. CONTRACTOR IS RESPONSIBLE FOR IDENTIFYING AND CONTACTING ANY OTHER PIPELINE OR UTILITY OWNERS WITHIN THE PROJECT AREA:

DYNEGY (TARGA RESOURCES, INC.) CONTACT: DARRELL REDD PHONE: 713-574-1000

- 6. THE CONTRACTOR SHALL VISIT THE SITE OF WORK TO BECOME FAMILIAR WITH THE LOCAL CONDITIONS AND WHAT EFFECTS THE CONDITIONS MAY HAVE ON ACCESS AND CONSTRUCTION. PLANS AND SPECIFICATIONS ARE COMPLEMENTARY; WHAT IS REQUIRED BY ONE IS BINDING AS IF REQUIRED BY ALL. CLARIFICATIONS AND INTERPRETATIONS OF, OR NOTIFICATIONS OF MINOR VARIATIONS AND DEVIATIONS IN THE CONTRACT DOCUMENTS. WILL BE ISSUED BY THE ENGINEER.
- 7. THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, EXISTING ELEVATIONS AND CONDITIONS SHOWN ON THE DRAWINGS PRIOR TO ORDERING MATERIAL, COMMENCEMENT OF CONSTRUCTION, AND PREPARATION OF SHOP DRAWINGS. THE ENGINEER SHALL BE NOTIFIED OF ALL DISCREPANCIES.

#### GENERAL NOTES (CON'T):

- 8. LOCATIONS OF ALL STRUCTURES SHOWN ON THE DRAWINGS ARE APPROXIMATE. THE CONTRACTOR SHALL PROVIDE ALL SURVEY PERSONNEL AND EQUIPMENT NECESSARY TO LAYOUT THE STRUCTURES AT THE BEGINNING OF CONSTRUCTION, PER TS—7.
- 9. THE CONTRACTOR SHALL ACCESS THE PROJECT SITE FROM A NAVIGABLE WATER BODY. DREDGING FOR SITE ACCESS SHALL ONLY BE PERFORMED WITHIN THE LIMITS SHOWN FOR TEMPORARY ACCESS CHANNELS (REFER TO SHEET 4, SITE PLAN). NO UPLAND ACCESS IS AVAILABLE.
- 10. THE PROJECT IS WITHIN AND ADJACENT TO ENVIRONMENTALLY SENSITIVE AREAS. THE CONTRACTOR SHALL COORDINATE WITH REFUGE TO AVOID /MINIMIZE IMPACTS TO THESE AREAS DURING THE COURSE OF THE WORK.
- 11. THE CONTRACTOR SHALL BE FAMILIAR WITH EXISTING SOFT SOIL CONDITIONS AT THE WORK SITE. GEOTECHNICAL INFORMATION IS PROVIDED IN APPENDIX A OF THE SPECIFICATIONS. THE SOIL BORING LOCATIONS ARE SHOWN ON SHEET 3.
- 12. SUBSTANTIAL CHANGES TO THE TOPOGRAPHY AND BATHYMETRY OF THE PROJECT SITE MAY HAVE OCCURRED SINCE THE SURVEYS SHOWN ON THESE DRAWINGS. ACTUAL LOCATION OF CONSTRUCTION BASELINE AND OFFSETS TO PROPOSED WORK WILL BE DETERMINED BY ENGINEER PRIOR TO CONSTRUCTION BASED ON RESULTS OF CONTRACTORS PRECONSTRUCTION SURVEY.
- 13. TIDAL DATUMS IN THE TABLE ON THIS SHEET ARE SHOWN FOR INFORMATIONAL PURPOSES ONLY. THE TIDAL DATUMS SHOWN REPRESENT CONDITIONS AT A TIDE STATION AND DO NOT NECESSARILY REPRESENT CONDITIONS AT THE PROJECT SITE. TIDAL DATUM DATA IS BASED ON NOAA CALCASIEU STATION (8768094).

#### STANDARD ABBREVIATIONS:

ADD BW EL EST DIA.	= ADDITIVE ALTERNATE = BREAKWATER = ELEVATION = ESTIMATED = DIAMFTER	FT GALV MAX MIN NWC	= FEET = GALVANIZED = MAXIMUM = MINIMUM = NORMAL WEIGHT CONCRETE
T.O.	= TOP OF	PTS	= POINTS
B.O.	= BOTTOM OF	SPA	= SPACING
MHHW	= MEAN HIGHER HIGH WATER	SS	= STAINLESS STEEL
MLLW	= MEAN LOWER LOW WATER	TEMP	= TEMPORARY
EA.	= EACH	TYP.	= TYPICAL
TYP.	= TYPICAL	t	= THICK
O.C.	= ON CENTER	U.N.O.	= UNLESS NOTED OTHERWISE
O.D.	= OUTSIDE DIAMETER	N.T.S.	= NOT TO SCALE
O.H.W.	= ORDINARY HIGH WATER	W.P.	= WORKING POINT
APPROX	= APPROXIMATE	,	= MINUTES OR FEET
BM	= BENCHMARK	"	= SECONDS OR INCHES
PL	= PLATE		223323 3 11,01,20

### **VERTICAL TIDAL DATUMS (NAVD88)**

= AS-BUILT REVISIONS

HORIZONTAL/VERTICAL SURVEY MONUMENT CONTROL TABLE				
NAME	NORTHING	EASTING	ELVATION (NAVD88)	
ME-18-SM-01	420,724.78	2,824,955.19	6.05	

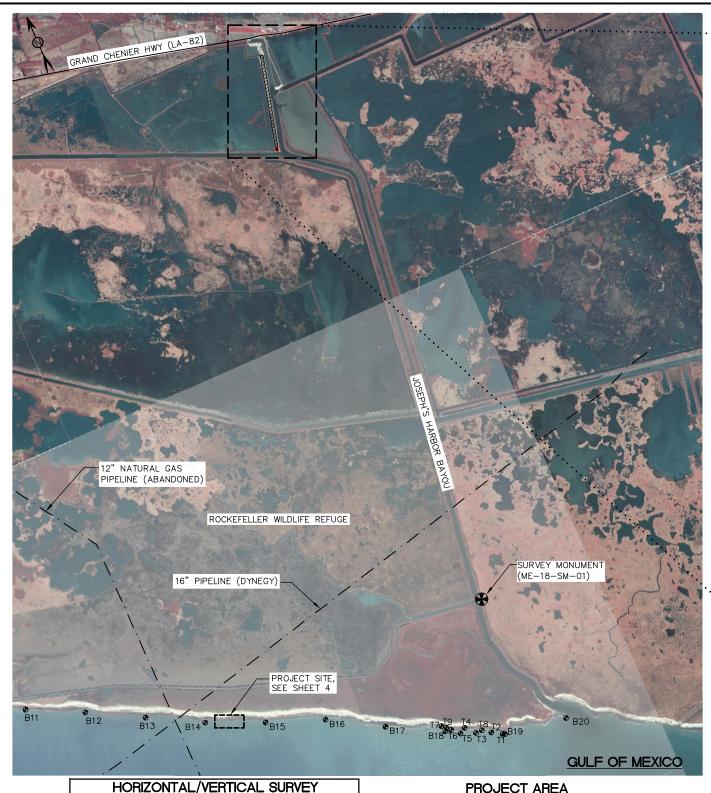
#### SUMMARY OF AS-BUILT QUANTITIES BW-A STA 0+00 TO 2+15 STA 3+50 TO 5+65 TEM NO DESCRIPTION QUANTITY UNIT MOBILIZATION AND DEMOBILIZATION LUMP SUM LUMP SUM CONSTRUCTION SURVEYS OYSTERBREAK ARMOR UNITS (OYSTERKRETE) - FABRICATE & DELIVER FACH 631 OYSTERBREAK ARMOR UNITS (NORMAL WEIGHT CONCRETE) - FABRICATE & DELIVER EACH 629 1,260 EACH OYSTERBREAK ARMOR UNITS - INSTALL MARINE MATTRESS SQUARE FEET 18,480 NAVIGATION AIDS FACH 4





COAST & HARBOR ENGINEERING 3410 FAR WEST BLVD., SUITE 210 AUSTIN, TX 78731 PH 512-342-9516 FAX 512-342-9708				
	С	3/30/2012	AS-BUILT DRAWINGS	SM
	В	11/10/2011	FOR CONSTRUCTION	СС
SUBMITTED UNDER THE AUTHORITY OF HUGO E. BERMUDEZ, P.E. 30107	Α	4/20/2011	FOR BID	SH
	REV.	DATE	DESCRIPTION	BY

LOUISIANA OFFICE OF COASTAL PROTECTION AND RESTORATION	BIO-ENGINEERED OYSTER REEF DEMONSTRATION PROJECT	GENERAL NOTES	
RESTORATION ENGINEERING DIVISION 450 LAUREL ST. NORTH CHASE TOWER, SUITE 1150-6 BATON ROUGE, LOUISIANA 70804		STATE PROJECT NUMBER: LA-08	
		FEDERAL PROJECT NUMBER: LA-08	DATE: 3/30/12
DRAWN BY: TM	DESIGNED BY: SH	APPROVED BY: RUSS JOFFRION, P.E.	SHEET 2 OF 16





### **CONTRACTOR USE AREA**

### NOTES:

AERIAL PHOTOGRAPH DOQQ FROM THE LOUISIANA STATEWIDE GIS, DATED 2005.

- THE CONTRACTOR USE AREA LOCATED OFF JOSEPH'S HARBOR BAYOU IN ROCKEFELLER REFUGE. UPLAND CONTRACTOR USE AREA ACCESS THE CONTRACTOR USE AREA LOCATED OFF JOSEPH'S HARBOR BAYOU IN ROCKEFELLER REFUGE. UPLAND CONTRACTOR USE AREA ACCESS IS AVAILABLE VIA GRAND CHENIER HWY. WATER ACCESS IS AVAILABLE VIA JOSEPH'S HARBOR BAYOU; HOWEVER, CONTRACTOR IS RESPONSIBLE FOR VERIFYING WATER DEPTHS IN THE ACCESS ROUTE FROM THE PROJECT SITE TO THE USE AREA AND FOR OBTAINING A PERMIT FOR ANY ACCESS CHANNEL DREDGING. ACCESS TO THE HWY 82 BOAT RAMP AND THE CONTRACTOR USE AREA CROSSES PRIVATE PROPERTY AND REQUIRES PERMISSION OF LANDOWNER. COORDINATE WITH ROCKEFELLER WILDLIFE REFUGE AND LANDOWNER FOR ACCESS. SEE SPECIFICATIONS FOR CONTACT INFORMATION.
   LOCATIONS OF PIPELINES ARE APPROXIMATE AND MAY NOT BE REPRESENTATIVE OF ALL PIPELINES THAT EXIST WITHIN THE PROJECT SITE.
   THE CONTRACTOR SHALL PERFORM A MAGNETOMETER SURVEY OF PROJECT WORK LIMITS AND LOCATE ALL UTILITIES AND OBSTRUCTIONS PRIOR TO COMMENCING WORK. REFER TO SPECIFICATIONS TS—7, CONSTRUCTION SURVEYING.
   THERE IS NO UPLAND ACCESS TO THE PROJECT SITE. CONTRACTOR SHALL ACCESS PROJECT SITE FROM A NAVIGABLE WATER BODY.

EASTING

2,824,955.19

2,836,910.57

MONUMENT CONTROL TABLE

NORTHING

420,724.78

445,889.55

NAME

ME-18-SM-01

\*DOLAND AZ

**LEGEND** SOIL BORING

--- PIPELINES CONTRACTOR USE AREA

SURVEY MONUMENT

**HUGO E. BERMUDEZ** License No. 30107

3/30/12

OT VISIBLE ON PLAN SHEETS; SEE APPENDIX D OF TECHNIC	CAL S	PECIFICATION	ONS		
COAST & HARBOR ENGINEERING 3410 FAR WEST BLVD., SUITE 210 AUSTIN, TX 78731 PH 512-342-9516 FAX 512-342-9708		- 1 1			
	С	3/30/2012	AS-BUILT DRAWINGS	SM	ı
	В	11/10/2011	FOR CONSTRUCTION	СС	
SUBMITTED UNDER THE AUTHORITY OF HUGO E. BERMUDEZ, P.E. 30107	Α	4/20/2011	FOR BID	SH	L
	REV.	DATE	DESCRIPTION	BY	l

**ELVATION** 

(NAVD88) 6.05

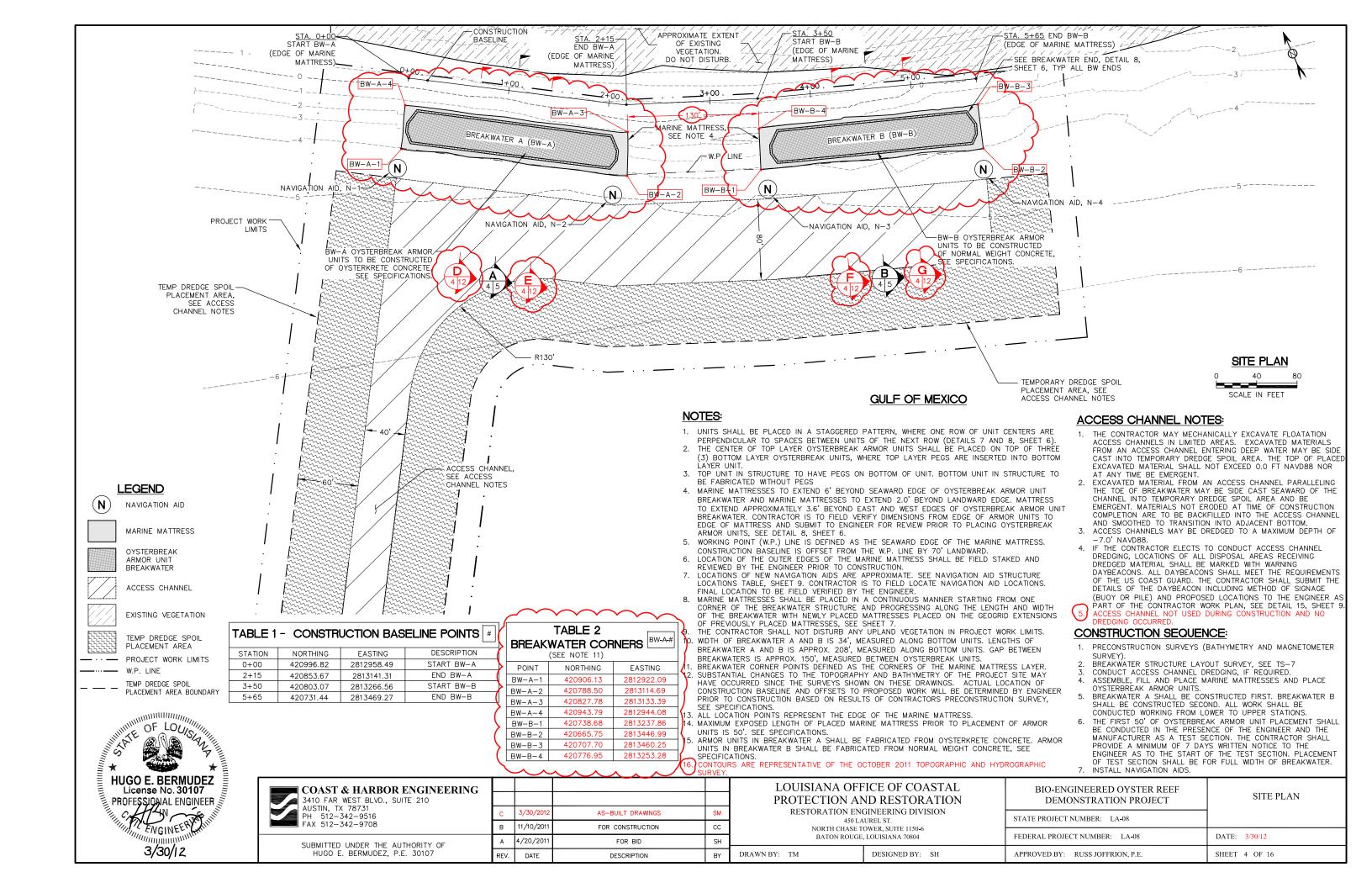
2.2

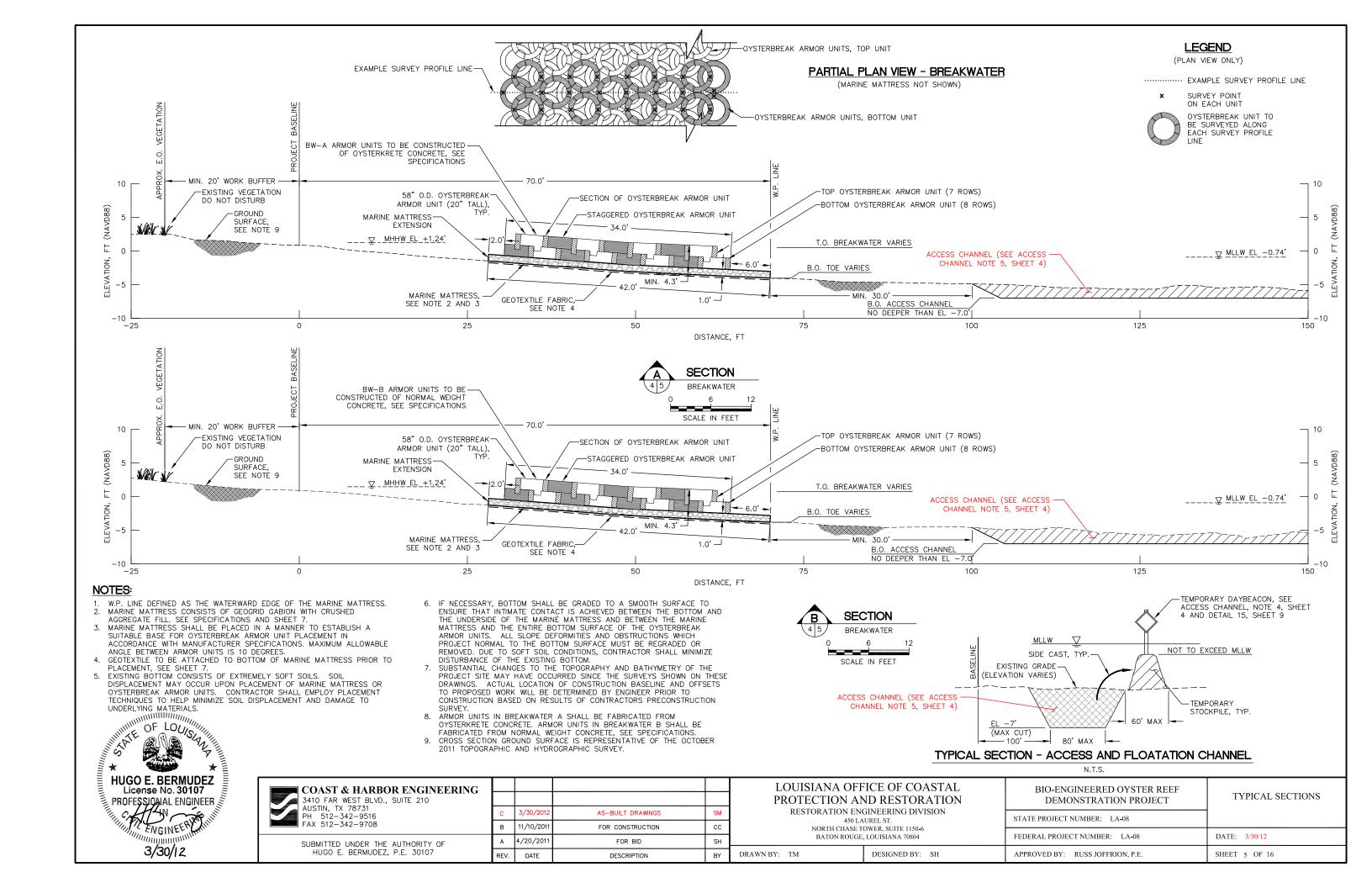
PROJECT AREA

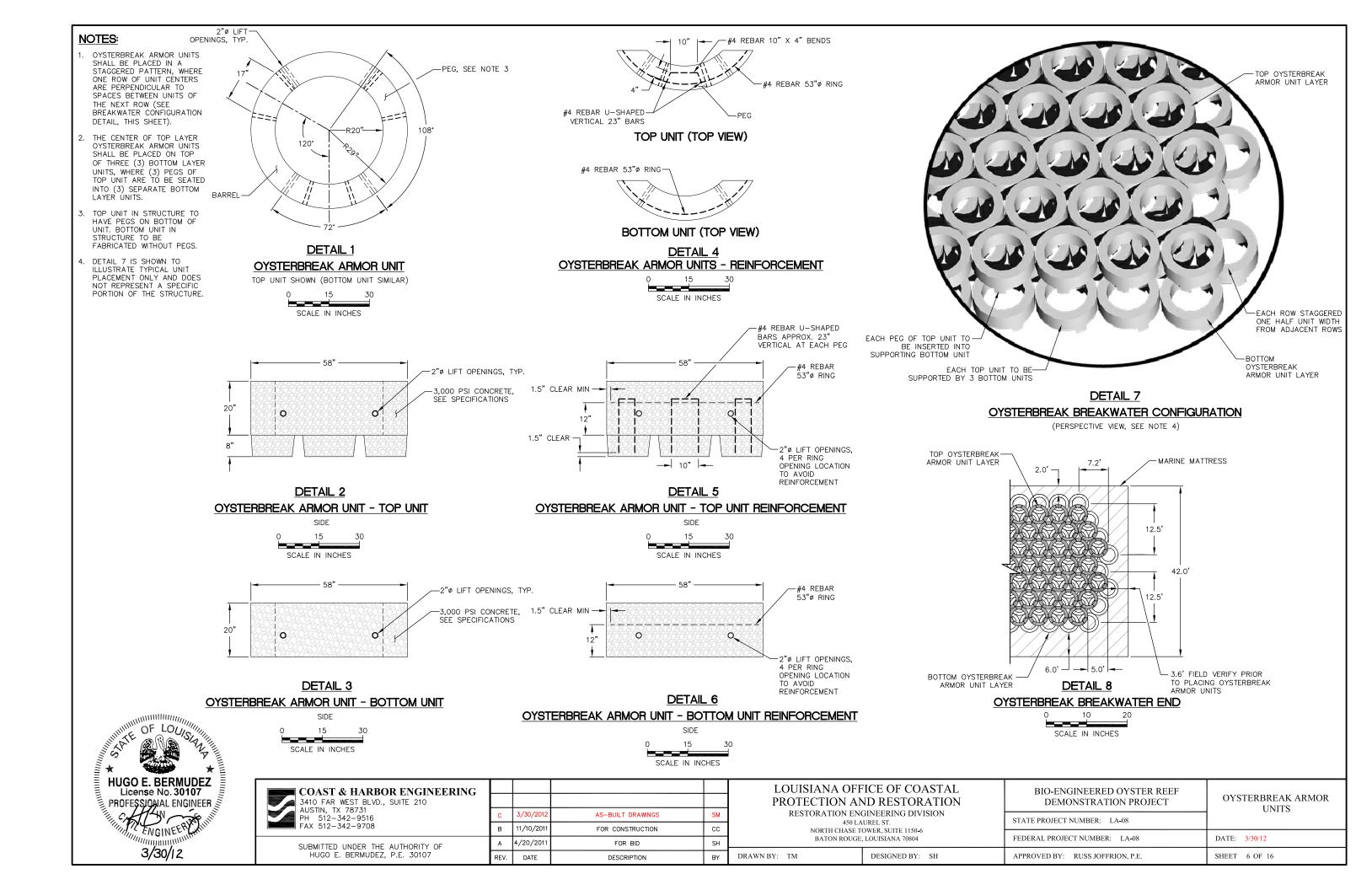
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SCALE IN FEET

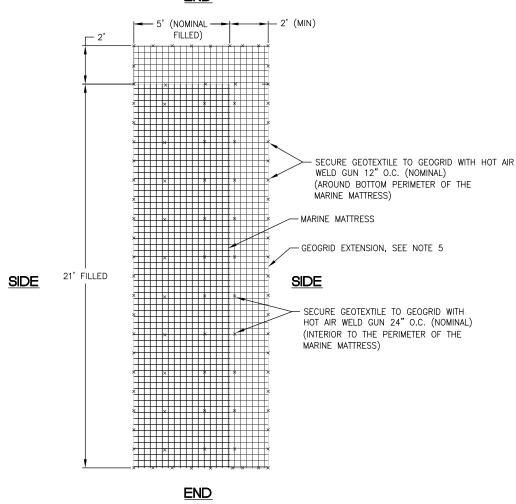
ISIBLE ON FLAN SHEETS, SEE AFFENDIX D OF TECHNICAL SPECIFICATIONS								
COAST & HARBOR ENGINEERING  3410 FAR WEST BLVD., SUITE 210 AUSTIN, TX 78731 PH 512-342-9516 FAX 512-342-9708					PROTECTION A	FICE OF COASTAL ND RESTORATION	BIO-ENGINEERED OYSTER REEF DEMONSTRATION PROJECT	PROJECT AREA AND CONTRACTOR USE AREA
	С	3/30/2012	M2 AS-BUILT DRAWINGS SM RESTORATION ENGINEERING DIVISION 450 LAUREL ST.		STATE PROJECT NUMBER: LA-08	CONTRACTOR OSL MALA		
	В	11/10/2011	FOR CONSTRUCTION	cc	NORTH CHASE TOWER, SUITE 1150-6			
SUBMITTED UNDER THE AUTHORITY OF		4/20/2011	FOR BID	SH	BATON ROUGE, LOUISIANA 70804		FEDERAL PROJECT NUMBER: LA-08	DATE: 3/30/12
HUGO E. BERMUDEZ, P.E. 30107	REV.	DATE	DESCRIPTION	BY	DRAWN BY: TM	DESIGNED BY: SH	APPROVED BY: RUSS JOFFRION, P.E.	SHEET 3 OF 16







#### **END**



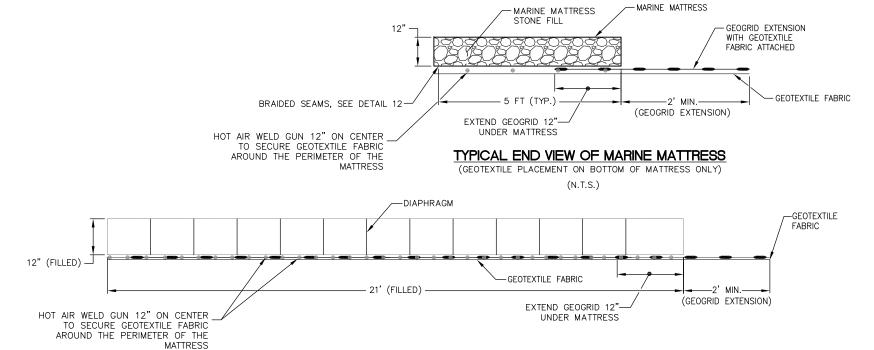
#### TYPICAL PLAN VIEW OF MARINE MATTRESS

(N.T.S.)

#### NOTES:

- 1. MARINE MATTRESS SHALL BE 21' LONG X 5' WIDE X 12" THICK TYPE TRITON GABION MATTRESS AS MANUFACTURED BY TENSAR EARTH TECHNOLOGIES OR ENGINEER APPROVED EQUAL.
- GEOTEXTILE FABRIC SHALL BE SECURELY ATTACHED TO THE BOTTOM OF EACH GEOGRID MATTRESS USING HOT
  AIR WELD GUN ON 12" ON CENTER INTERVALS AROUND THE PERIMETER OF THE MARINE MATTRESS AND 24" ON
  CENTER ACROSS CENTER ACROSS BOTTOM OF MATTRESS. ALTERNATE METHODS OF SECURING GEOTEXTILE TO
  GEOGRID MATTRESS SHALL BE APPROVED BY THE ENGINEER.
- GEOTEXTILE FABRIC SHALL COVER THE BOTTOM OF THE MARINE MATTRESS AND THE 2' GEOGRID EXTENSION.
   ANY SEAMS IN THE FABRIC SHALL BE OVERLAPPED BY 9" MINIMUM AND THERMALLY WELDED TO FORM A SECURE BOND BETWEEN THE ADJOINED PIECES.
- 5. GEOGRID EXTENSIONS WITH GEOTEXTILE FABRIC EXTEND ACROSS WIDTH OF MARINE MATTRESS AT ONE END AND ONE SIDE OF MATTRESS TO ALLOW FOR END—TO—END AND SIDE—TO—SIDE OVERLAP BETWEEN ADJACENT MATTRESS. LAST MATTRESS IN PLACEMENT SERIES AT END AND SIDE STRUCTURE DOES NOT REQUIRE EXTENSION.

6. NOMINAL FILLED MARINE MATTRESS WEIGHT IS APPROXIMATELY 5,250 LBS.



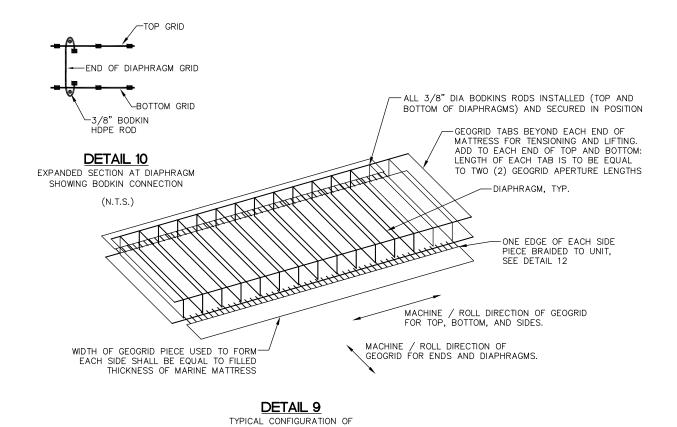
TYPICAL SIDE VIEW OF MARINE MATTRESS

(N.T.S.)



	_			
COAST & HARBOR ENGINEERING				
3410 FAR WEST BLVD., SUITE 210				
AUSTIN, TX 78731 PH 512-342-9516	С	3/30/2012	AS-BUILT DRAWINGS	SM
FAX 512-342-9708	В	11/10/2011	FOR CONSTRUCTION	СС
SUBMITTED UNDER THE AUTHORITY OF	Α	4/20/2011	FOR BID	SH
HUGO E. BERMUDEZ, P.E. 30107		DATE	DESCRIPTION	BY

LOUISIANA OFFI PROTECTION AN	D RESTORATION	BIO-ENGINEERED OYSTER REEF DEMONSTRATION PROJECT	MARINE MATTRESS DETAILS
RESTORATION ENG 450 LAU	REL ST.	STATE PROJECT NUMBER: LA-08	
NORTH CHASE TOWER, SUITE 1150-6 BATON ROUGE, LOUISIANA 70804		FEDERAL PROJECT NUMBER: LA-08	DATE: 3/30/12
DRAWN BY: TM	DESIGNED BY: SH	APPROVED BY: RUSS JOFFRION, P.E.	SHEET 7 OF 16

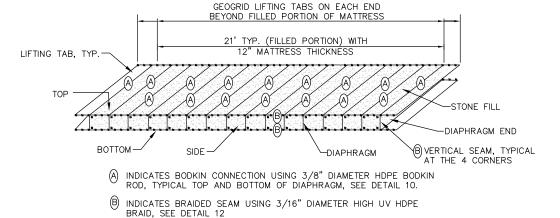


## **FABRICATION NOTES:**

1. TYPICAL SPACING OF DIAPHRAGMS IS EVERY THREE APERTURE LENGTHS IN THE GEOGRID MATERIAL. A SHORTER SPACING MAY BE USED IN ORDER TO MATCH THE REQUIRED MATTRESS LENGTH. LENGTH OF END PIECES AND

FABRICATED MARINE MATTRESS (N.T.S.)

- INTERNAL DIAPHRAGM PIECES ARE 2 GEOGRID APERTURES LONG.
  2. SEE DETAIL 11, TYPICAL CONFIGURATION OF FILLED MATTRESS FOR ADDITIONAL DIMENSIONS AND MATERIAL TYPES.
- 3. GEOGRID/GEOTEXTILE EXTENSIONS NOT SHOWN.



#### **DETAIL 11**

TYPICAL CONFIGURATION OF FILLED MARINE MATTRESS UNITS (N.T.S.)

#### **CONSTRUCTION NOTES:**

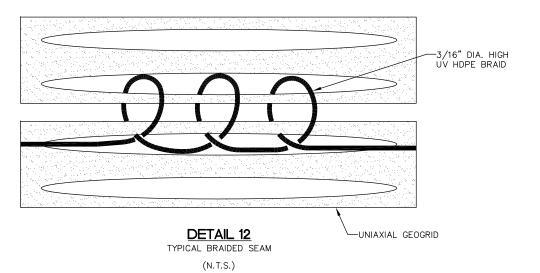
- 1. ENDS, TOP, BOTTOM, SIDES AND ANY EXTRA LENGTH USED FOR LIFTING OR ANCHORING PURPOSES SHALL BE COMPOSED OF TYPE 2 GEOGRID, PLASTIC CABLE TIES MAY BE USED TO SECURE BODKIN CONNECTORS IN POSITION PRIOR TO TENSIONING OR FILLING OF MAT UNITS.
- IN POSITION PRIOR TO TENSIONING OR FILLING OF MAI UNITS.

  2. INTERNAL DIAPHRAGMS SHALL BE COMPOSED OF TYPE 1 GEOGRID.

  3. MARINE MATTRESS SHALL BE FILLED WITH ASTM CLASS #1 STONE OR ENGINEER APPROVED EQUIVALENT, SEE SPECIFICATIONS

  4. NOMINAL WIDTH: 5 FT (FILLED)

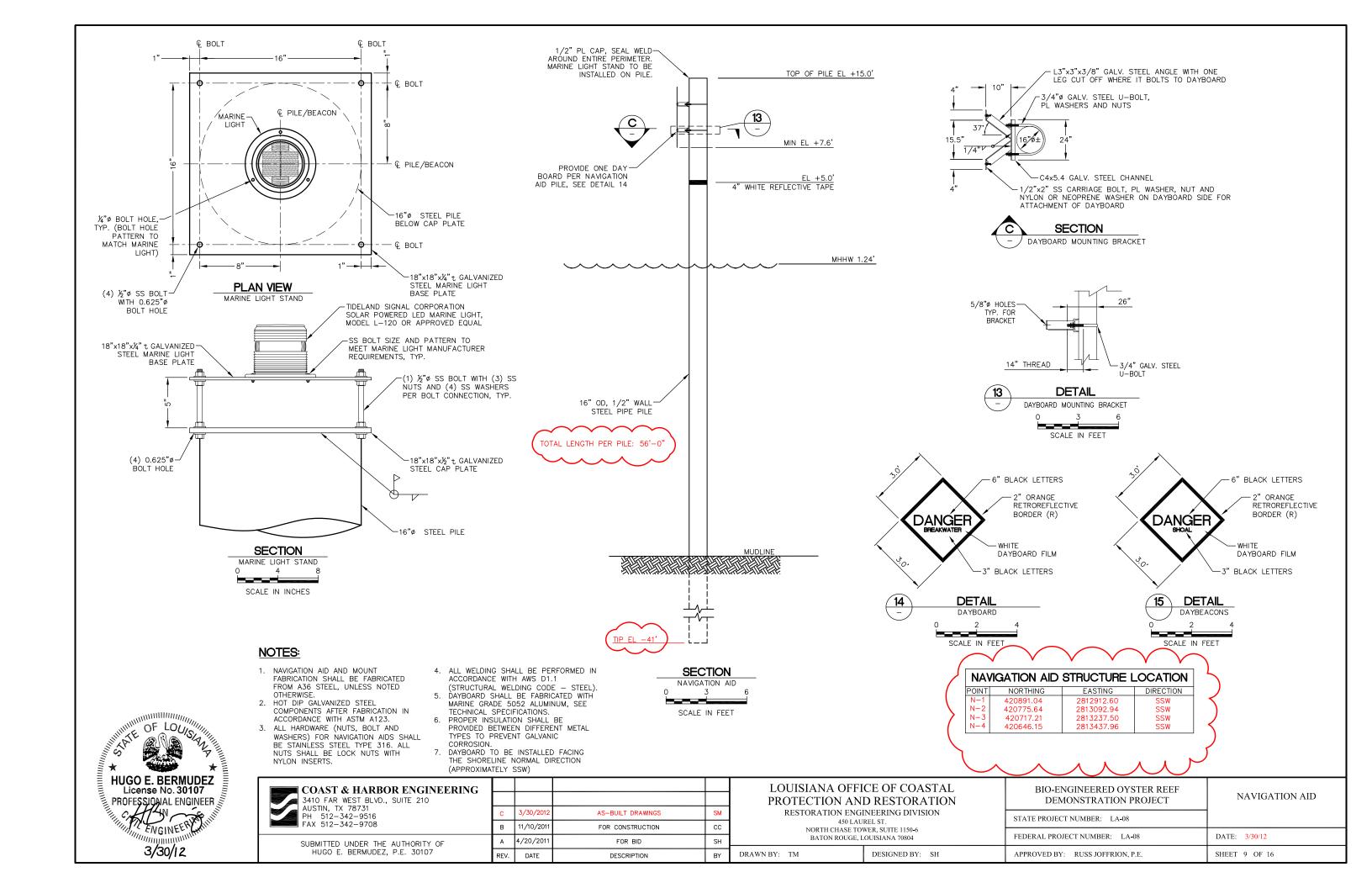
- 4. NOMINAL WIDTH: 5 FT (FILLED)
  5. NOMINAL THICKNESS: 1 FT (FILLED)
  6. NOMINAL LENGTH: 21 FT (FILLED)
  7. GEOGRID/GEOTEXTILE EXTENSIONS NOT SHOWN

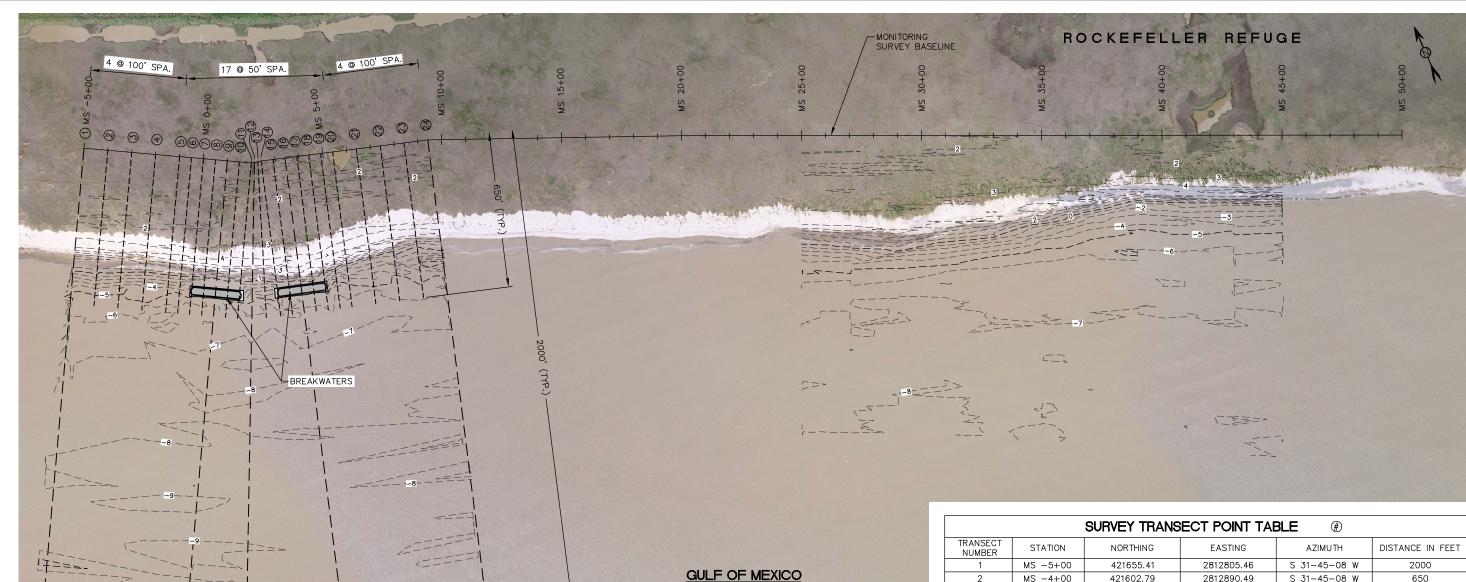




COAST & HARBOR ENGINEERING				
3410 FAR WEST BLVD., SUITE 210 AUSTIN, TX 78731 PH 512-342-9516 FAX 512-342-9708				
		3/30/2012	AS-BUILT DRAWINGS	SM
		11/10/2011	FOR CONSTRUCTION	СС
SUBMITTED UNDER THE AUTHORITY OF	Α	4/20/2011	FOR BID	SH
HUGO E. BERMUDEZ, P.E. 30107	REV.	DATE	DESCRIPTION	BY

LOUISIANA OFFI PROTECTION AN	D RESTORATION	BIO-ENGINEERED OYSTER REEF DEMONSTRATION PROJECT	MARINE MATTRESS DETAILS	
RESTORATION ENGI 450 LAU	REL ST.	STATE PROJECT NUMBER: LA-08		
NORTH CHASE TOWER, SUITE 1150-6 BATON ROUGE, LOUISIANA 70804		FEDERAL PROJECT NUMBER: LA-08	DATE: 3/30/12	
DRAWN BY: TM	DESIGNED BY: SH	APPROVED BY: RUSS JOFFRION, P.E.	SHEET 8 OF 16	





SURVEY PLAN

SCALE IN FEET

400

DRAWN BY: TM

NOTES:

1. AERIAL PHOTOGRAPH BY GULF COAST AERIAL MAPPING (225) 355-9722, FLOWN MARCH 24, 2012.
2. REFER TO CONTROL TABLE AND NOTES ON SHEETS 2 AND 3.

BREAKWATERS SHOWN FOR REFERENCE PURPOSES.
THE MONITORING SURVEY BASELINE SHOWN ON SHEET 10 AND 11 ARE TO BE USED FOR ESTABLISHING THE MONITORING SURVEY SECTIONS. LAYOUT AND CONSTRUCTION OF THE BREAKWATER STRUCTURES ARE TO BE BASED ON THE

CONSTRUCTION BASELINE SHOWN ON SHEET 4.
CONTOURS ARE REPRESENTATIVE OF THE FEBRUARY 2012 TOPOGRAPHIC AND HYDROGRAPHIC MONITORING SURVEY.



#### LEGEND:

- +5 - MAJOR CONTOUR

- +4 - MINOR CONTOUR

COAST & HARBOR ENGINEERING 3410 FAR WEST BLVD., SUITE 210				
AUSTIN, TX 78731 PH 512-342-9516	С	3/30/2012	AS-BUILT DRAWINGS	SM
FAX 512-342-9708	В	11/10/2011	FOR CONSTRUCTION	СС
SUBMITTED UNDER THE AUTHORITY OF	Α	4/20/2011	FOR BID	SH
HUGO E. BERMUDEZ, P.E. 30107	REV.	DATE	DESCRIPTION	BY

1	MS -5+00	421655.41	2812805.46	S 31-45-08 W	2000
2	MS -4+00	421602.79	2812890.49	S 31-45-08 W	650
3	MS -3+00	421550.16	2812975.52	S 31-45-08 W	650
4	MS -2+00	421497.54	2813060.56	S 31-45-08 W	650
5	MS -1+00	421444.91	2813145.59	S 31-45-08 W	650
6	MS -0+50	421418.60	2813188.11	S 31-45-08 W	650
7	MS 0+00	421392.29	2813230.62	S 31-45-08 W	650
8	MS 0+50	421365.98	2813273.14	S 31-45-08 W	650
9	MS 1+00	421339.66	2813315.66	S 31-45-08 W	2000
10	MS 1+50	421313.35	2813358.17	S 31-45-08 W	650
11	MS 2+00	421287.04	2813400.69	S 31-45-08 W	650
12	MS 2+14	421283.74	2813413.94	S 27-38-08 W	2000
13	MS 2+28	421280.20	2813428.17	S 23-35-03 W	650
14	MS 2+42	421276.90	2813441.42	S 19-28-01 W	650
15	MS 2+92	421260.24	2813488.56	S 19-28-01 W	650
16	MS 3+42	420243.58	2813535.70	S 19-28-01 W	2000
17	MS 3+92	421226.91	2813582.85	S 19-28-01 W	650
18	MS 4+42	421210.25	2813629.99	S 19-28-01 W	650
19	MS 4+92	421193.59	2813677.13	S 19-28-01 W	650
20	MS 5+42	421176.92	2813724.27	S 19-28-01 W	650
21	MS 6+42	421143.60	2813818.55	S 19-28-01 W	650
22	MS 7+42	421110.27	2813912.84	S 19-28-01 W	650
23	MS 8+42	421076.94	2814007.12	S 19-28-01 W	650
24	MS 9+42	421043.62	2814101.40	S 19-28-01 W	2000

LOUISIANA OFFICE OF COASTAL
PROTECTION AND RESTORATION
RESTORATION ENGINEERING DIVISION

450 LAUREL ST. NORTH CHASE TOWER, SUITE 1150-6 BATON ROUGE, LOUISIANA 70804

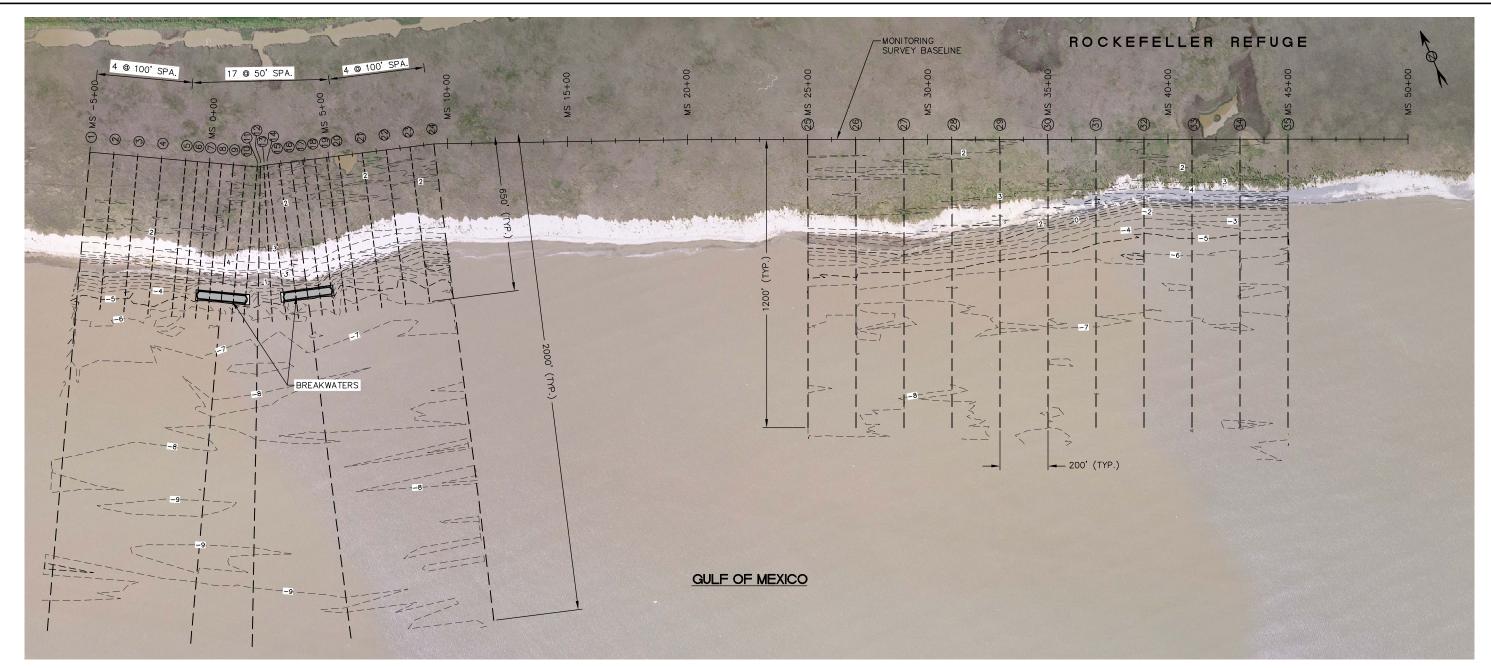
DESIGNED BY: SH

DEMONSTRATION PROJECT
STATE PROJECT NUMBER: LA-08
FEDERAL PROJECT NUMBER: LA-08
APPROVED BY: RUSS JOFFRION, P.E.

BIO-ENGINEERED OYSTER REEF

INITIAL MONITORING SURVEY PLAN

DATE: 3/30/12 SHEET 10 OF 16



### NOTES:

1) AERIAL PHOTOGRAPH BY GULF COAST AERIAL MAPPING (225) 355-9722, FLOWN MARCH 24, 2012.
2. REFER TO CONTROL TABLE AND NOTES ON SHEETS 2 AND 3.

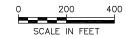
BREAKWATERS SHOWN FOR REFERENCE PURPOSES.
THE MONITORING SURVEY BASELINE SHOWN ON SHEET 10 AND 11 ARE TO BE USED FOR ESTABLISHING THE MONITORING SURVEY SECTIONS. LAYOUT AND CONSTRUCTION OF THE BREAKWATER STRUCTURES ARE TO BE

BASED ON THE CONSTRUCTION BASELINE SHOWN ON SHEET 4. CONTOURS ARE REPRESENTATIVE OF THE FEBRUARY 2012 TOPOGRAPHIC AND HYDROGRAPHIC MONITORING SURVEY.



#### LEGEND:

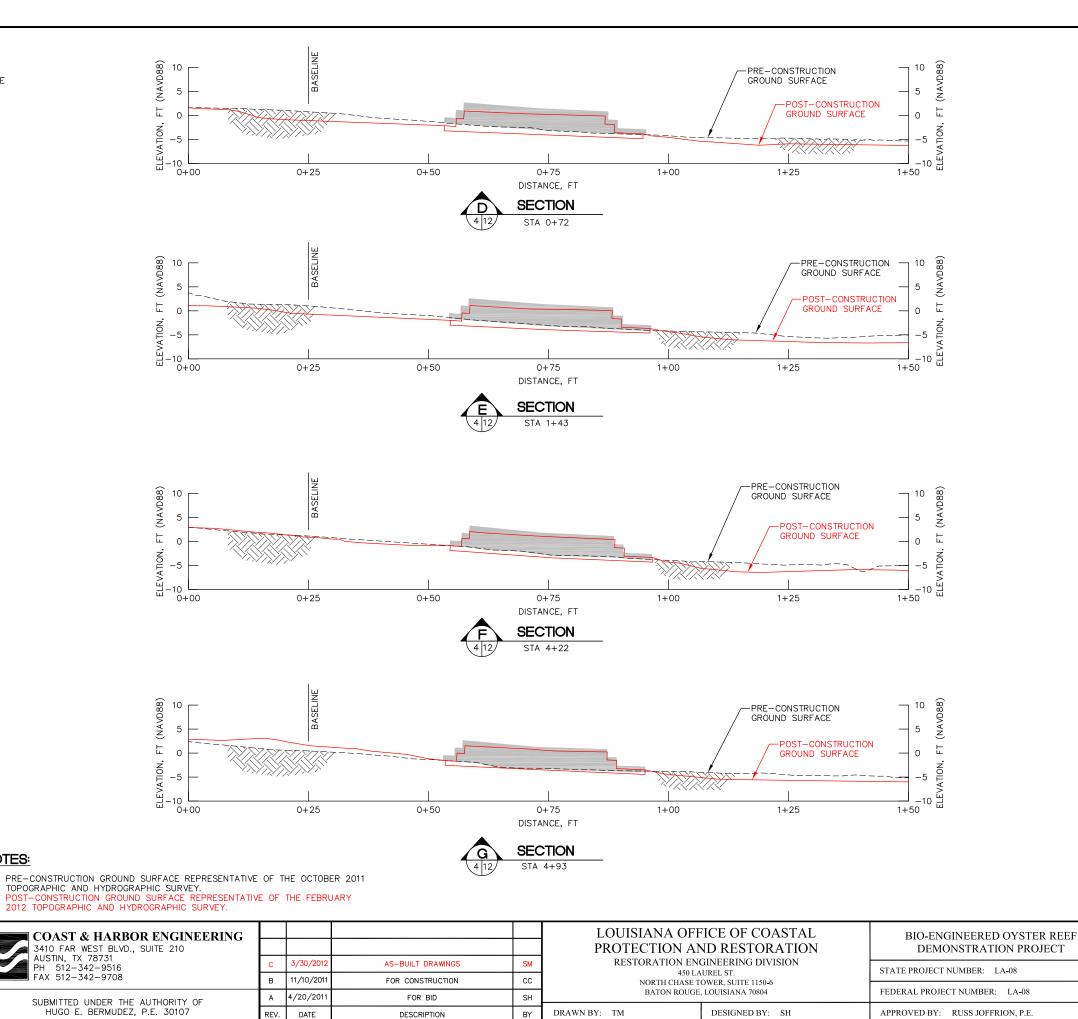
- +5 - MAJOR CONTOUR - +4 - MINOR CONTOUR FINAL MONITORING SURVEY PLAN



ADDITIONAL SURVEY TRANSECT POINTS FOR FINAL MONITORING SURVEY #						
TRANSECT NUMBER	STATION	NORTHING	EASTING	AZIMUTH	DISTANCE IN FEET	
25	MS 25+00	420360.38	2815501.59	S 26-37-15 W	1200	
26	MS 27+00	420270.76	2815680.38	S 26-37-15 W	1200	
27	MS 29+00	420181.15	2815859.18	S 26-37-15 W	1200	
28	MS 31+00	420091.53	2816037.98	S 26-37-15 W	1200	
29	MS 33+00	420001.92	2816216.78	S 26-37-15 W	1200	
30	MS 35+00	419912.30	2816395.58	S 26-37-15 W	1200	
31	MS 37+00	419822.69	2816574.38	S 26-37-15 W	1200	
32	MS 39+00	419733.07	2816753.18	S 26-37-15 W	1200	
33	MS 41+00	419643.46	2816931.98	S 26-37-15 W	1200	
34	MS 43+00	419553.84	2817110.77	S 26-37-15 W	1200	
35	MS 45+00	419464.22	2817289.57	S 26-37-15 W	1200	

COAST & HARBOR ENGINEERING				
3410 FAR WEST BLVD., SUITE 210				
AUSTIN, TX 78731 PH 512-342-9516	С	3/30/2012	AS-BUILT DRAWINGS	SM
FAX 512-342-9708		11/10/2011	FOR CONSTRUCTION	СС
SUBMITTED UNDER THE AUTHORITY OF	Α	4/20/2011	FOR BID	SH
HUGO E. BERMUDEZ, P.E. 30107		DATE	DESCRIPTION	BY

1	LOUISIANA OFFICE OF COASTAL PROTECTION AND RESTORATION		BIO-ENGINEERED OYSTER REEF DEMONSTRATION PROJECT	POST-CONSTRUCTION MONITORING	
RESTORATION ENGINEERING DIVISION 450 LAUREL ST. NORTH CHASE TOWER, SUITE 1150-6 BATON ROUGE, LOUISIANA 70804		UREL ST.	STATE PROJECT NUMBER: LA-08	SURVEY PLAN	
			FEDERAL PROJECT NUMBER: LA-08	DATE: 3/30/12	
DRAWN BY:	TM	DESIGNED BY: SH	APPROVED BY: RUSS JOFFRION, P.E.	SHEET 11 OF 16	



20

SCALE IN FEET

EXISTING BATHYMETRIC

SECTIONS

DATE: 3/30/12

SHEET 12 OF 16

40



NOTES:

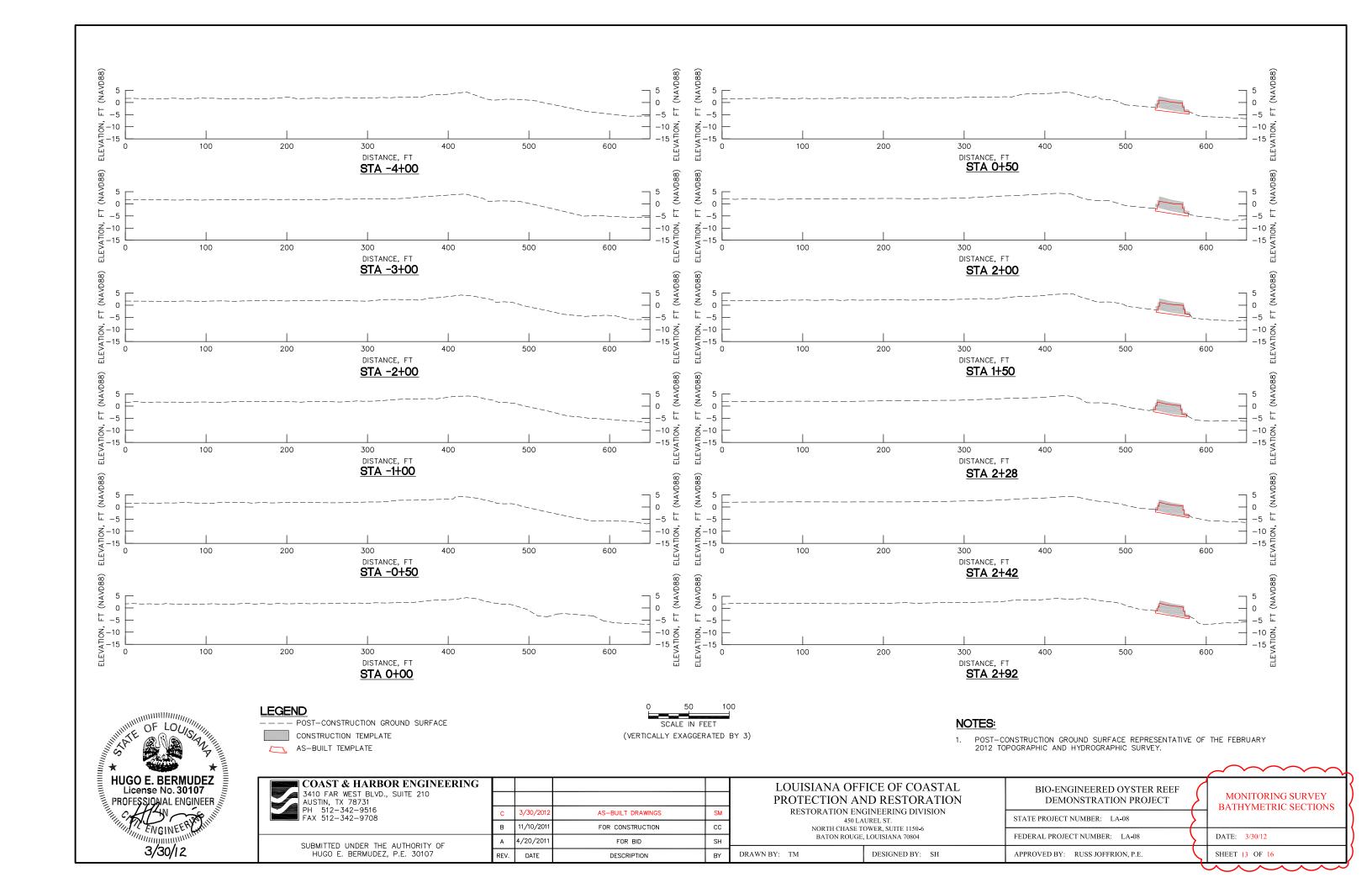
**LEGEND** 

---- PRE-CONSTRUCTION GROUND SURFACE

CONSTRUCTION TEMPLATE

AS-BUILT TEMPLATE

- POST-CONSTRUCTION GROUND SURFACE



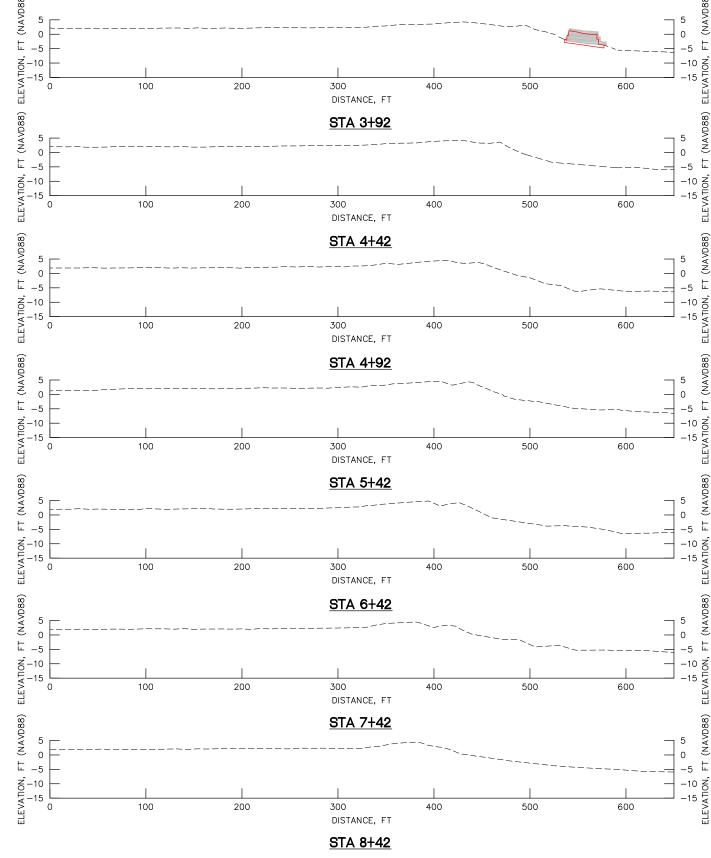
### **LEGEND**

---- POST-CONSTRUCTION GROUND SURFACE

CONSTRUCTION TEMPLATE AS-BUILT TEMPLATE

#### NOTES:

1. POST-CONSTRUCTION GROUND SURFACE REPRESENTATIVE OF THE FEBRUARY 2012 TOPOGRAPHIC AND HYDROGRAPHIC SURVEY.



DRAWN BY: TM



COAST & HARBOR ENGINEERING  3410 FAR WEST BLVD., SUITE 210  AUSTIN, TX 78731  PH 512-342-9516  FAX 512-342-9708				
	С	3/30/2012	AS-BUILT DRAWINGS	SM
	В	11/10/2011	FOR CONSTRUCTION	СС
SUBMITTED UNDER THE AUTHORITY OF HUGO E. BERMUDEZ, P.E. 30107 FOR BIDDING AND CONSTRUCTION	Α	4/20/2011	FOR BID	SH
	REV.	DATE	DESCRIPTION	BY

LOUISIANA OFFICE OF COASTAL PROTECTION AND RESTORATION RESTORATION ENGINEERING DIVISION 450 LAUREL ST. NORTH CHASE TOWER, SUITE 1150-6 BATON ROUGE, LOUISIANA 70804	BIO-ENGINEERED OYSTER REEF DEMONSTRATION PROJECT
	STATE PROJECT NUMBER: LA-08
	FEDERAL PROJECT NUMBER: LA-08

DESIGNED BY: SH

MONITORING SURVEY **BATHYMETRIC SECTIONS** 

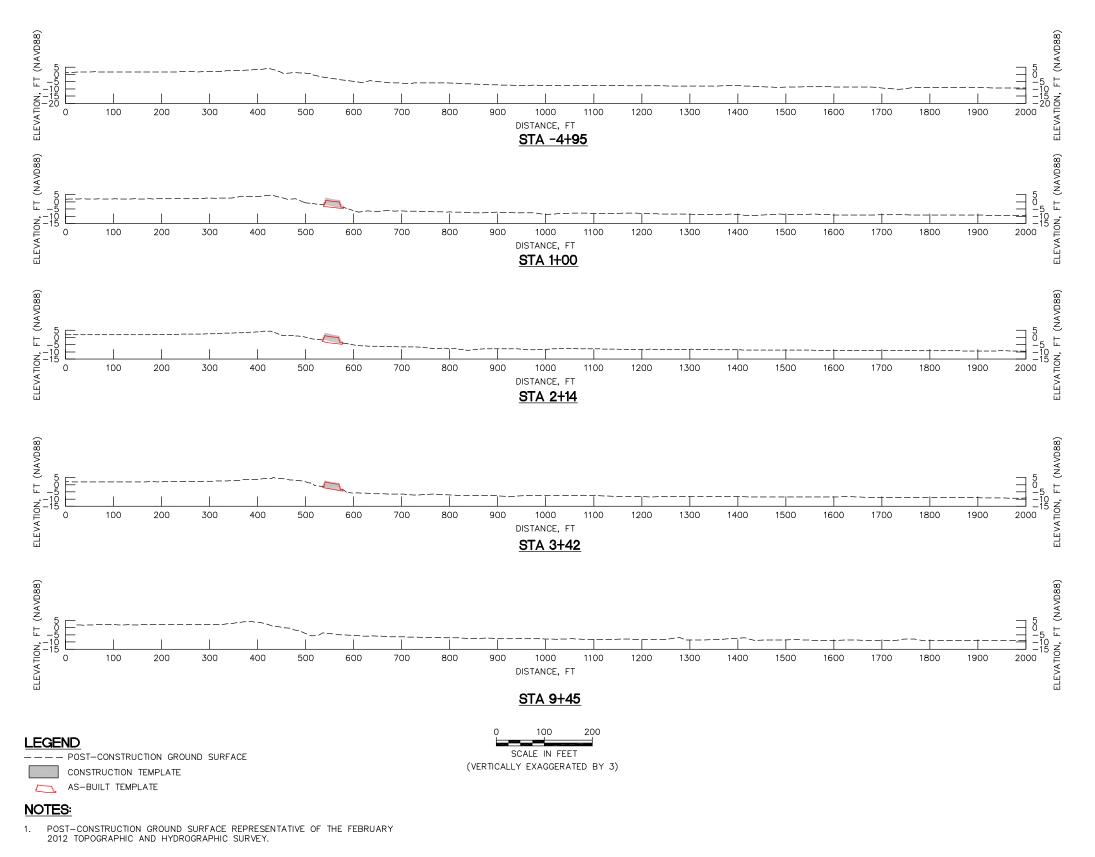
SCALE IN FEET

(VERTICALLY EXAGGERATED BY 3)

DATE: 3/30/12 FEDERAL PROJECT NUMBER: LA-08

APPROVED BY: RUSS JOFFRION, P.E.

SHEET 14 OF 16





COAST & HARBOR ENGINEERING 3410 FAR WEST BLVD., SUITE 210 AUSTIN, TX 78731 PH 512-342-9516 FAX 512-342-9708 3/30/20 AS-BUILT DRAWINGS 11/10/201 FOR CONSTRUCTION CC SUBMITTED UNDER THE AUTHORITY OF 4/20/2011 FOR BID HUGO E. BERMUDEZ, P.E. 30107 FOR BIDDING AND CONSTRUCTION. DATE DESCRIPTION

#### LOUISIANA OFFICE OF COASTAL PROTECTION AND RESTORATION RESTORATION ENGINEERING DIVISION 450 LAUREL ST. NORTH CHASE TOWER, SUITE 1150-6

DRAWN BY: TM

BATON ROUGE, LOUISIANA 70804

DESIGNED BY: SH

BIO-ENGINEERED OYSTER REEF DEMONSTRATION PROJECT

STATE PROJECT NUMBER: LA-08

FEDERAL PROJECT NUMBER: LA-08

APPROVED BY: RUSS JOFFRION, P.E.

BATHYMETRIC SECTIONS

DATE: 3/30/12

SHEET 15 OF 16

MONITORING SURVEY

